



# **Armed Forces College of Medicine AFCM**



## **The Palate**

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**Professor of Anatomy and Embryology**

## INTENDED LEARNING OBJECTIVES (ILO)

**By the end of this lecture the student will be able to:**

- 1. Differentiate between hard palate and soft palate.**
- 2. Describe the muscles of the soft palate (attachments, nerve supply and actions).**
- 3. Discuss the blood supply and the nerve supply of the palate.**

# Lecture Plan



- 1. Part 1 (5 min) Introduction**
- 2. Part 2 (40 min) Main lecture**
- 3. Part 3 (5 min) Summary**

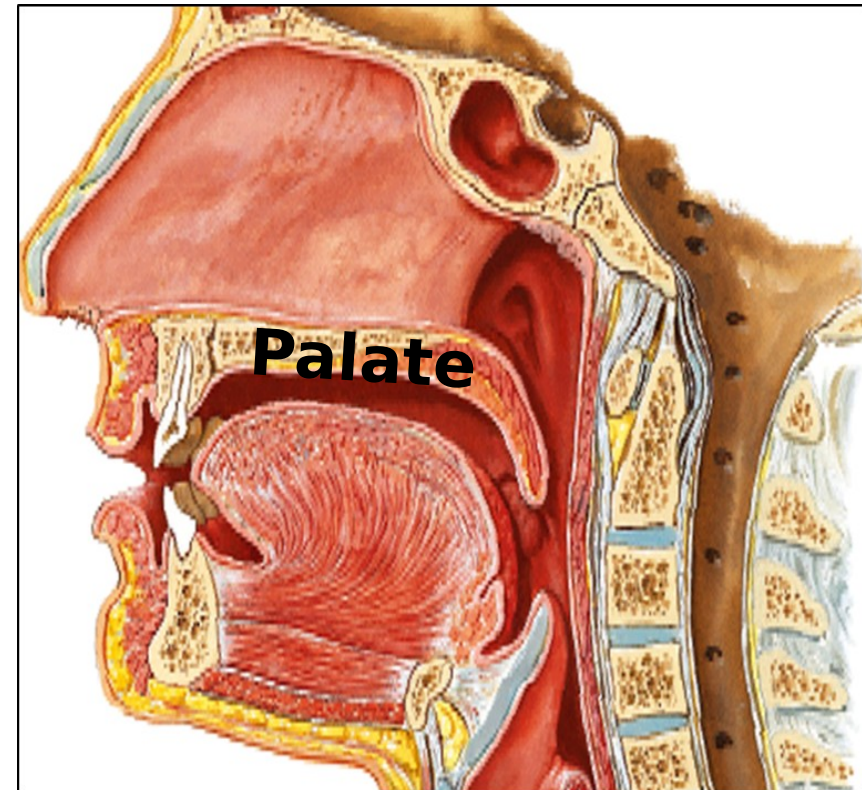
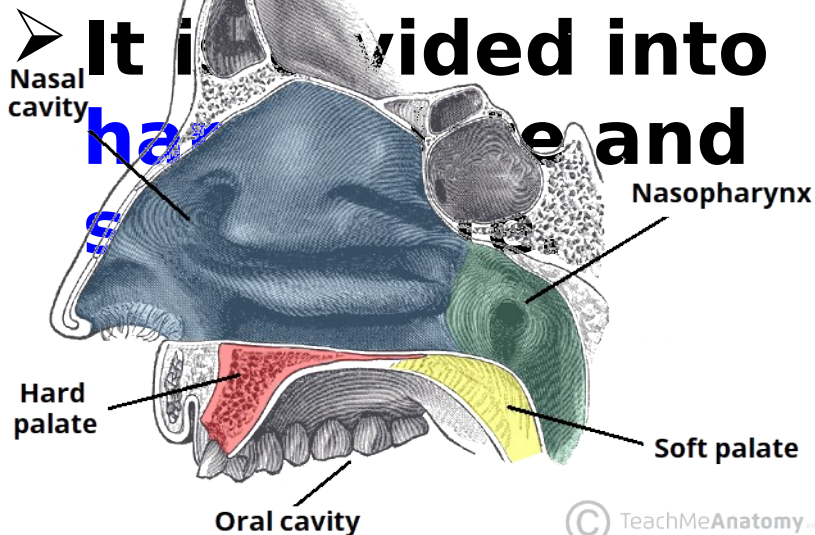
## **Key Points**



- 1. Hard palate; features, innervation and blood supply**
- 2. Soft palate; features, innervation and blood supply**
- 3. Muscles of the soft palate**

# The Palate

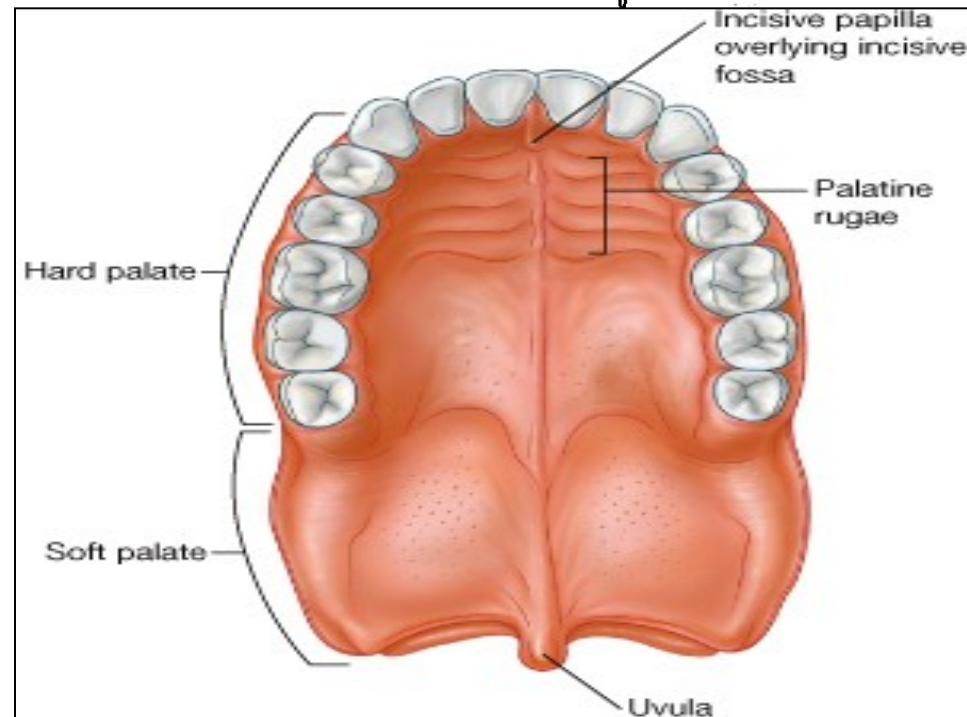
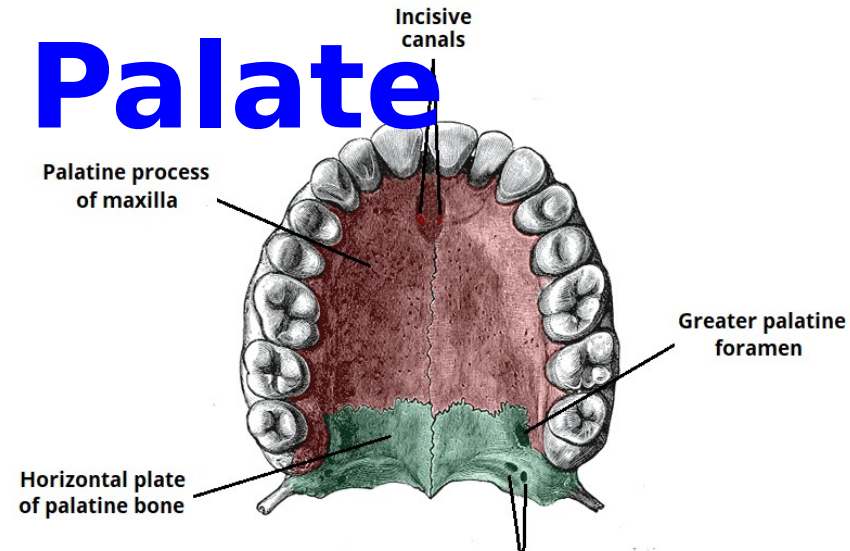
- It is a **partition** between:
  - The oral cavity (**below**)
  - The nasal cavity (**above**)



Atlas of human anatomy by Frank H. Netter,  
6<sup>th</sup> Edition

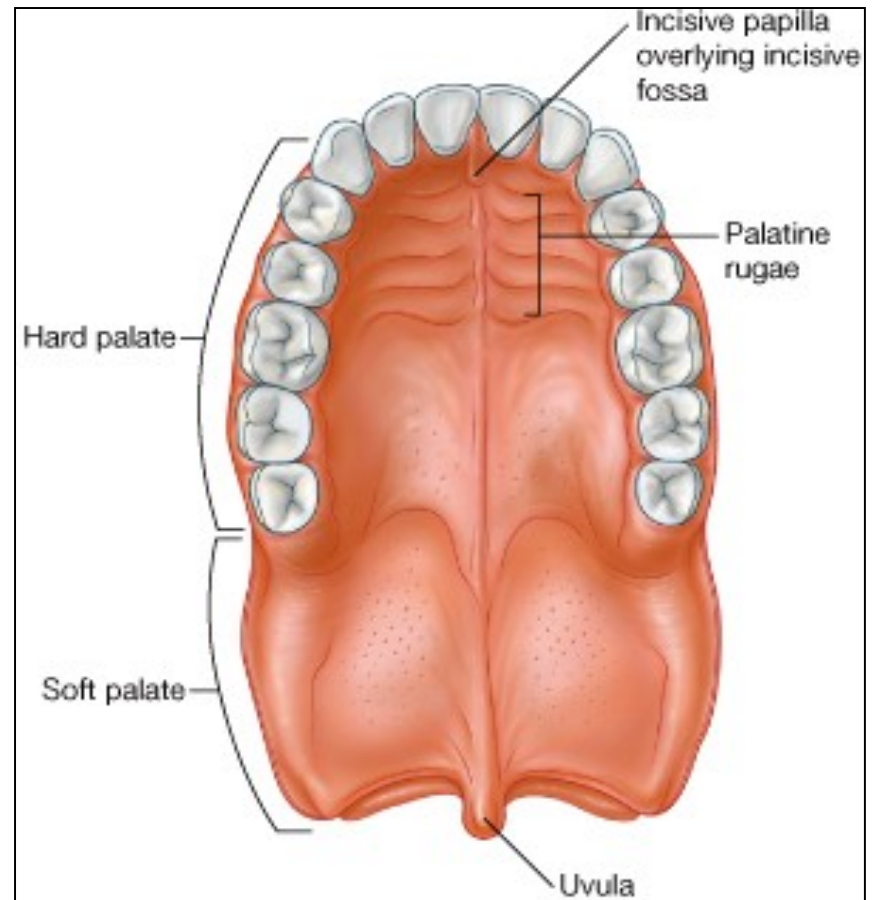
# The Hard Palate

- It is formed by:
  - Palatine processes of maxillae
  - The horizontal plates of palatine bones
- It is bounded anteriorly and laterally by the alveolar arch and gums.
- It is continuous posteriorly with the soft palate.



# The Hard Palate

- It is covered by a dense **mucoperiosteum** which is firmly attached to the bone.
- The mucoperiosteum shows the **mid palatine raphe** and **corrugations** called palatine rugae on both sides of the raphe.
- Anteriorly it **presents** incisive foramen covered by papilla.
- It gives passage to **nasopalatine nerve (descending)** and **greater palatine vessels (ascending)**.

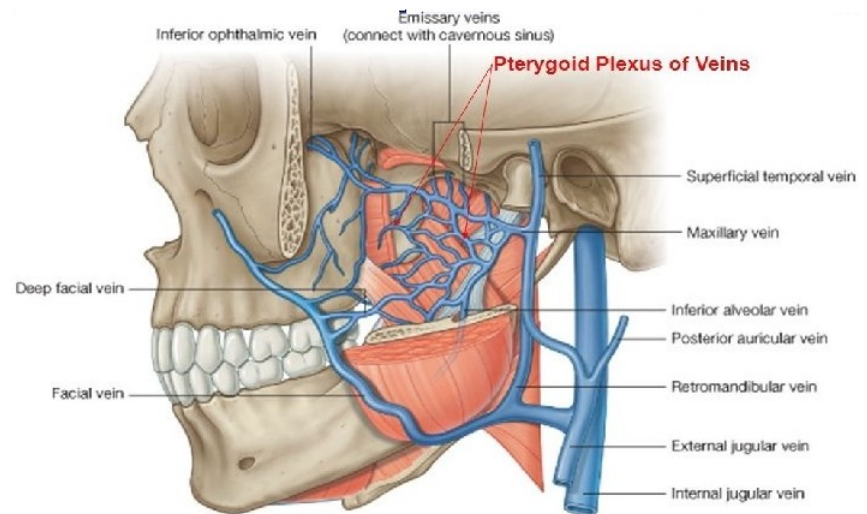
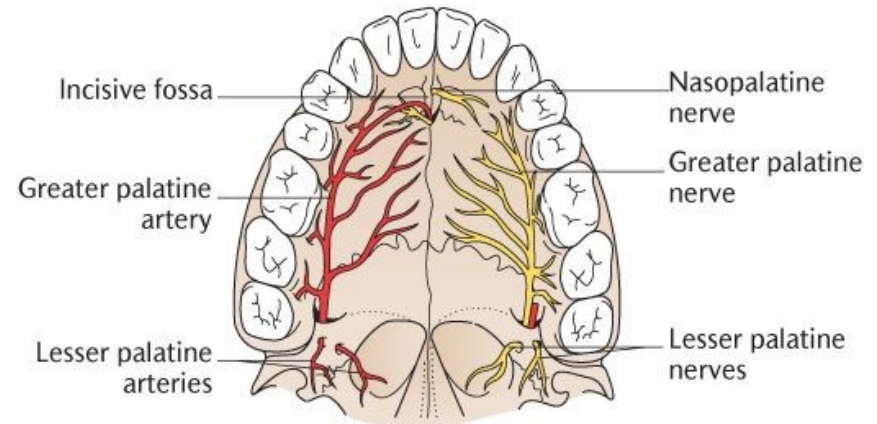


Gray's anatomy for students, 3<sup>rd</sup> Edition



# The Hard Palate

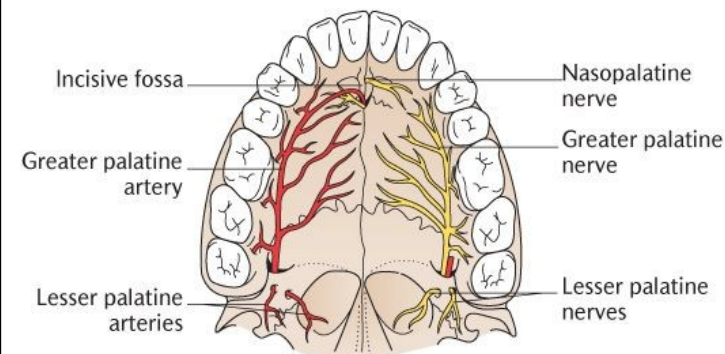
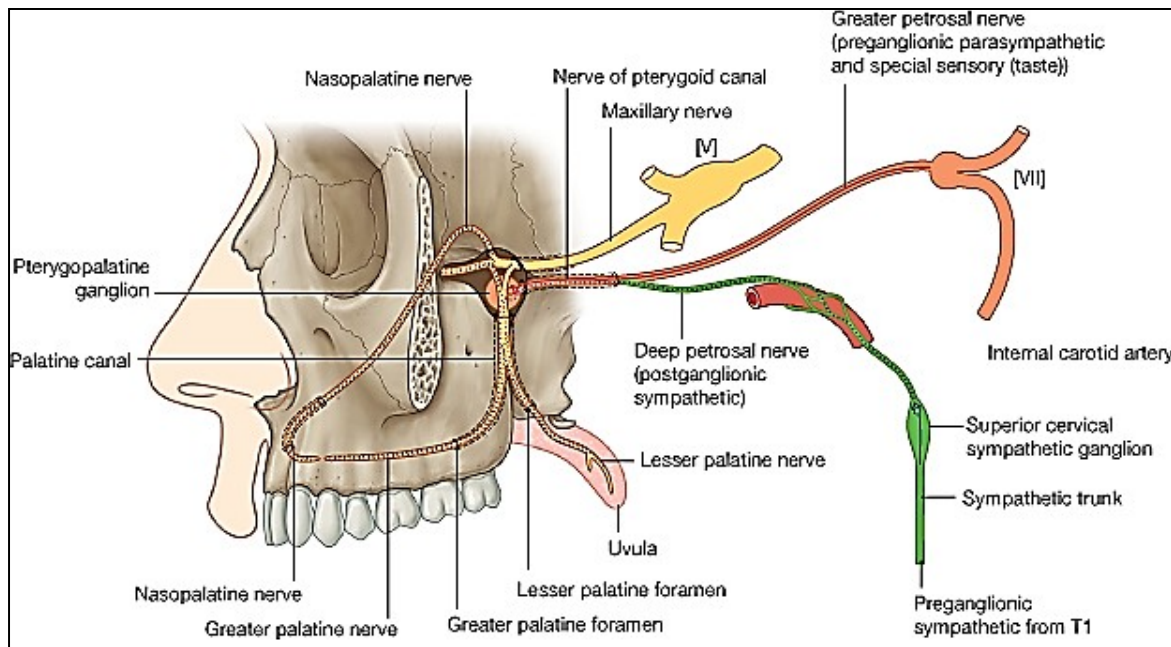
- ❑ **Blood supply of hard palate:**
  - **Greater palatine artery**, a branch of third part of maxillary artery.
  - **The veins end in pterygoid venous plexus.**



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# The Hard Palate

- **Nerve supply of hard palate:**
  - **Greater palatine nerve** but the anterior part is supplied by **nasopalatine (sphenopalatine)** nerve.
  - Both are branches from **pterygopalatine ganglia**.

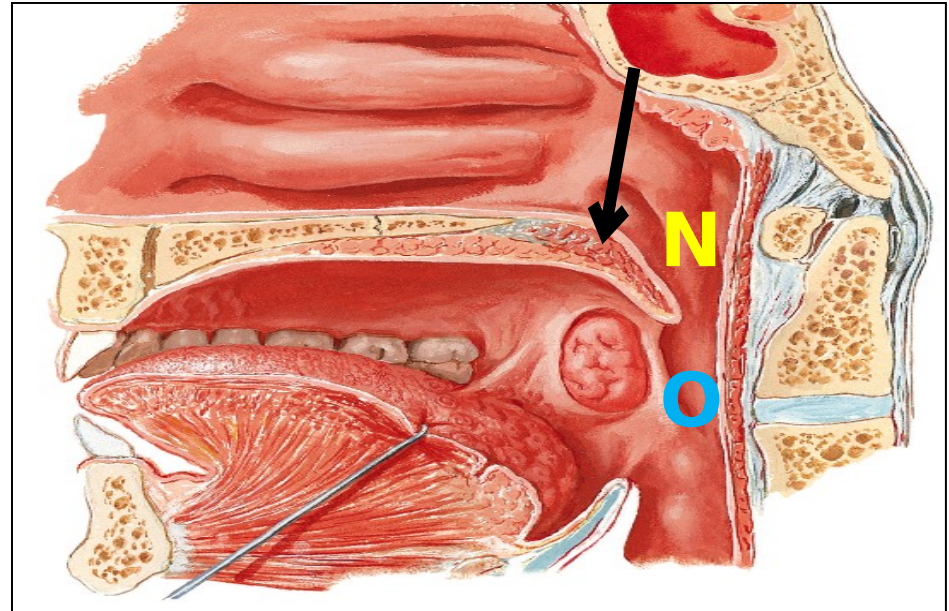




- **Mention one nervous structure passing through the incisive foramen.**
- **Describe blood supply of the hard palate.**

# The Soft Palate

- It is the **movable muscular part** of the palate extending from the posterior border of hard palate.
- It separates the **nasopharynx** from **oropharynx**.
- It is used in **speech** and in **swallowing** to prevent food from entering nose.

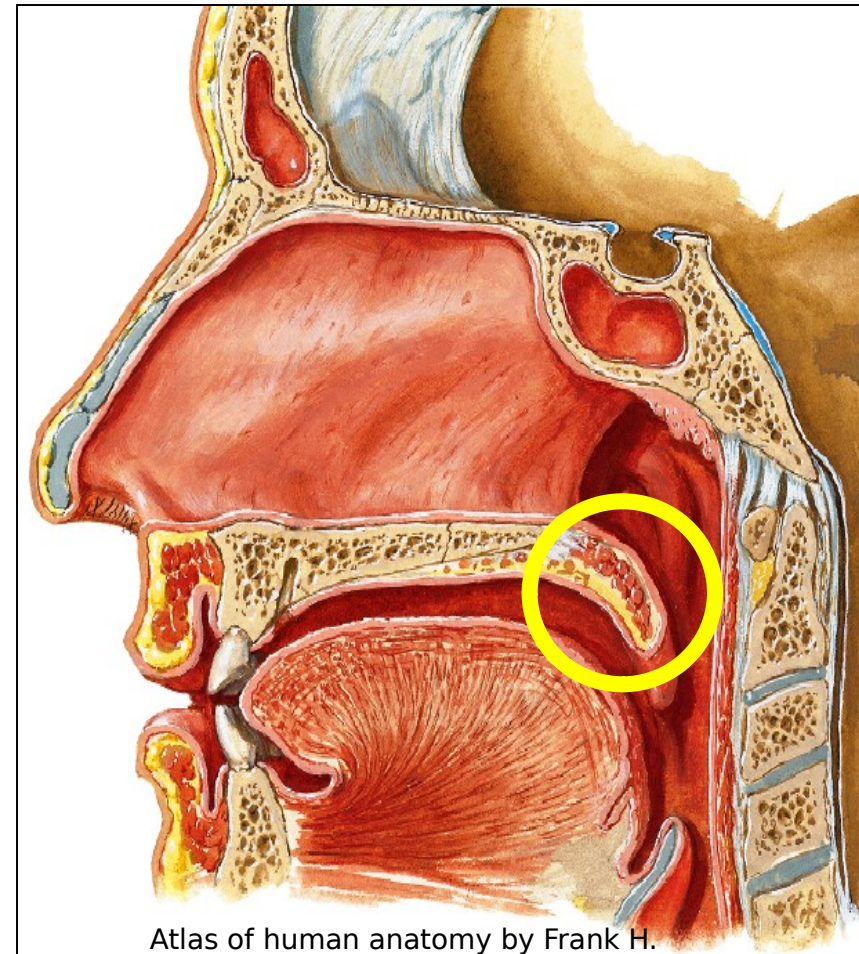


Atlas of human anatomy by Frank H. Netter,  
6<sup>th</sup> Edition

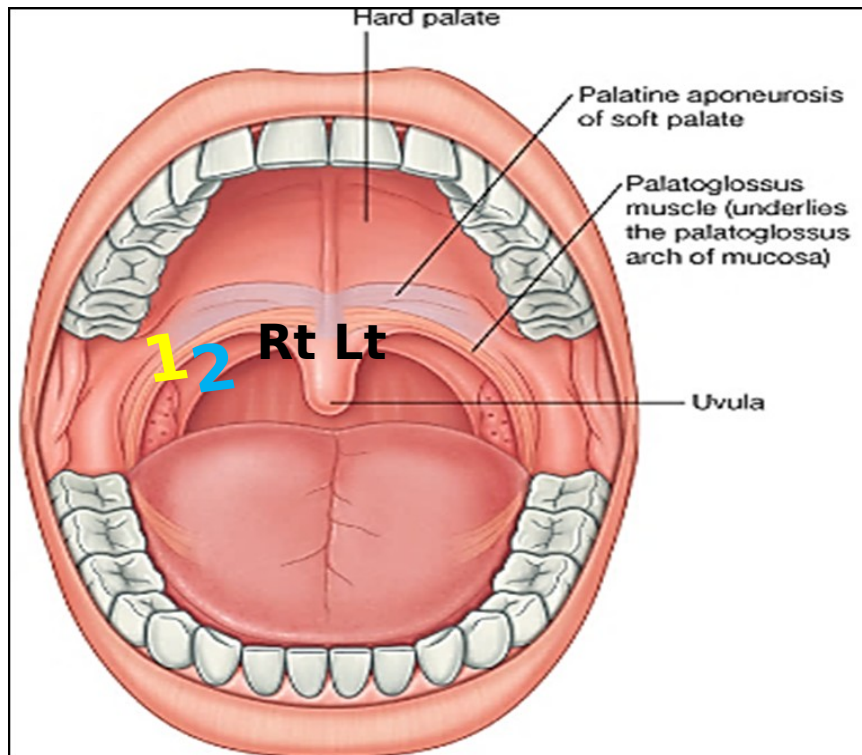


# The Soft Palate

- ❑ **Features:** it has 2 borders, 2 sides, 2 surfaces and 2 arches.
- **The superior border:** attached to the posterior border of hard palate.
- **inferior border:** free it has a median projection called uvula.
- **The anterior oral surface:** concave.
- **The posterior surface:** convex continuous with the nasal floor.
- **Anterior arch:** formed of the palatoglossal arch.
- **Posterior arch:** formed of the palatopharyngeal arch.

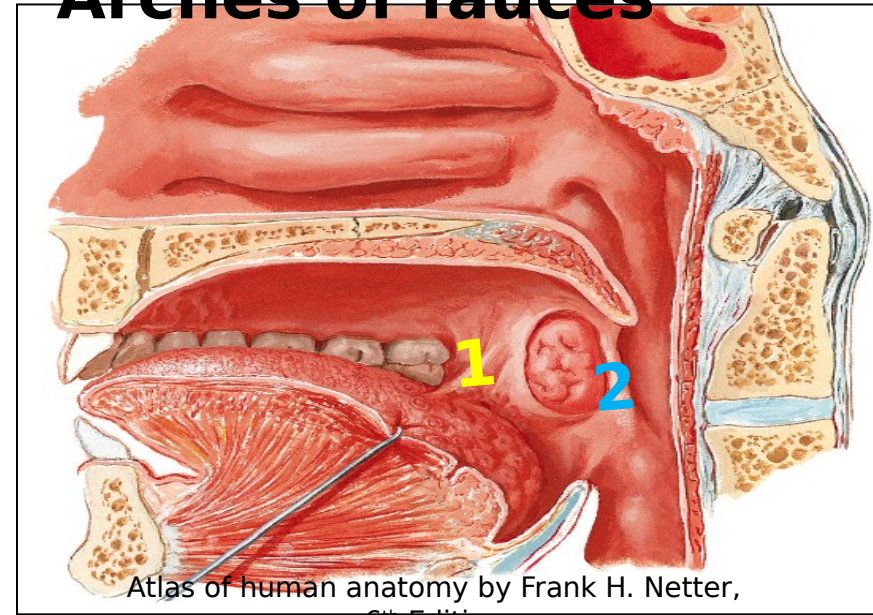


Atlas of human anatomy by Frank H. Netter, 6<sup>th</sup> Edition



Gray's anatomy for students, 3<sup>rd</sup> Edition

## Arches of fauces



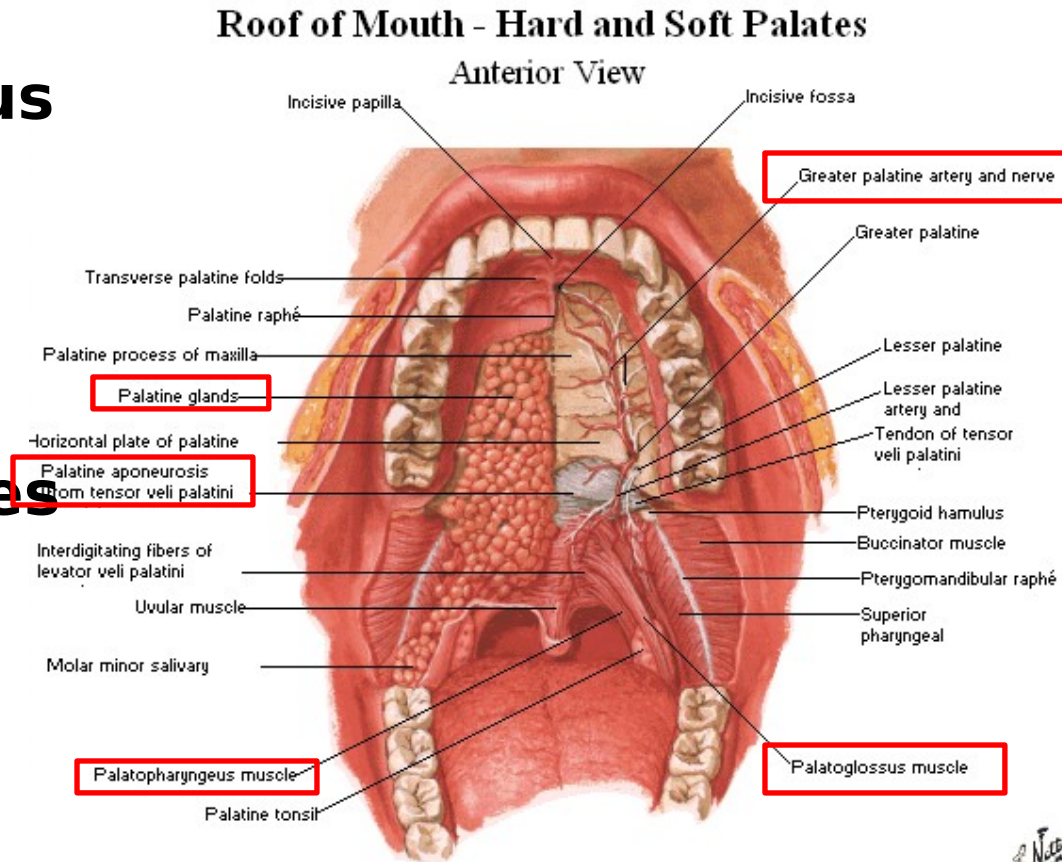
Atlas of human anatomy by Frank H. Netter,  
6<sup>th</sup> Edition

# The Soft Palate

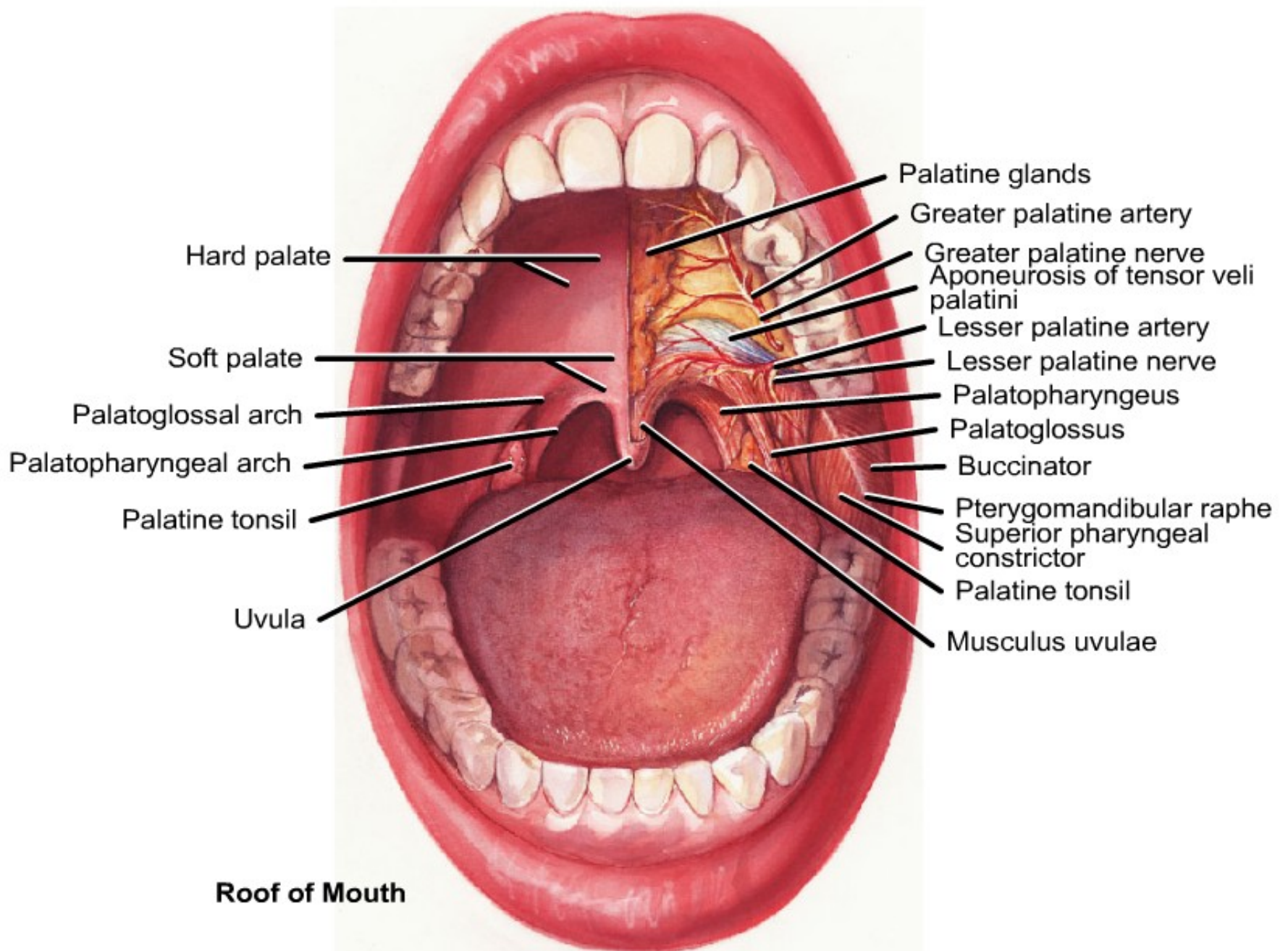
## ❑ Structure:

➤ It is a fold of mucous membrane containing:

- The palatine aponeurosis
- The palatine muscles
- Mucous glands
- Taste buds
- Vessels
- Nerves









# The Soft Palate

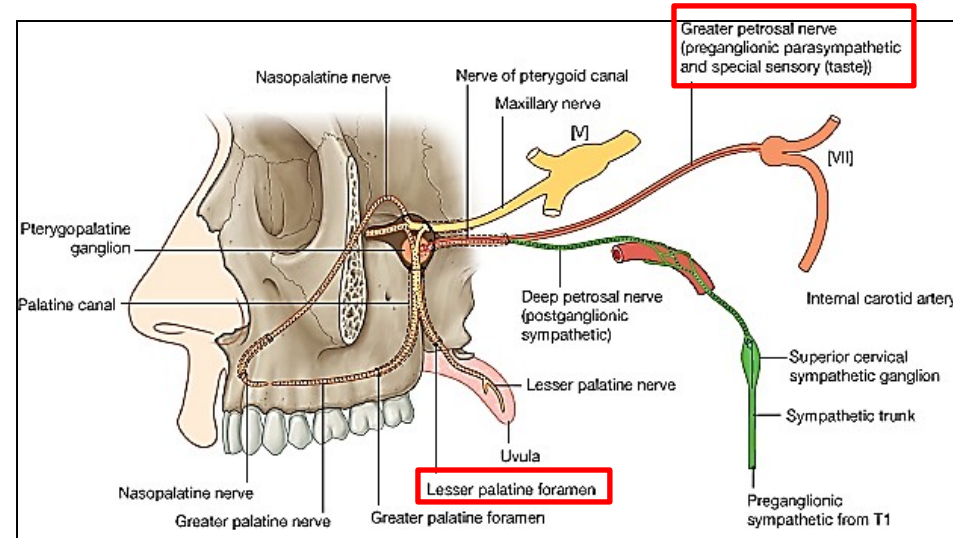
## □ Nerve supply:

### ▪ Motor nerve supply:

- All muscles of palate are supplied by **cranial accessory joining the vagus except tensor palati** which is supplied via **mandibular nerve trunk** (nerve to medial pterygoid).

### ▪ Sensory nerve supply:

- **General sensations:** by lesser palatine nerve.
- **Taste:** by greater petrosal nerve.

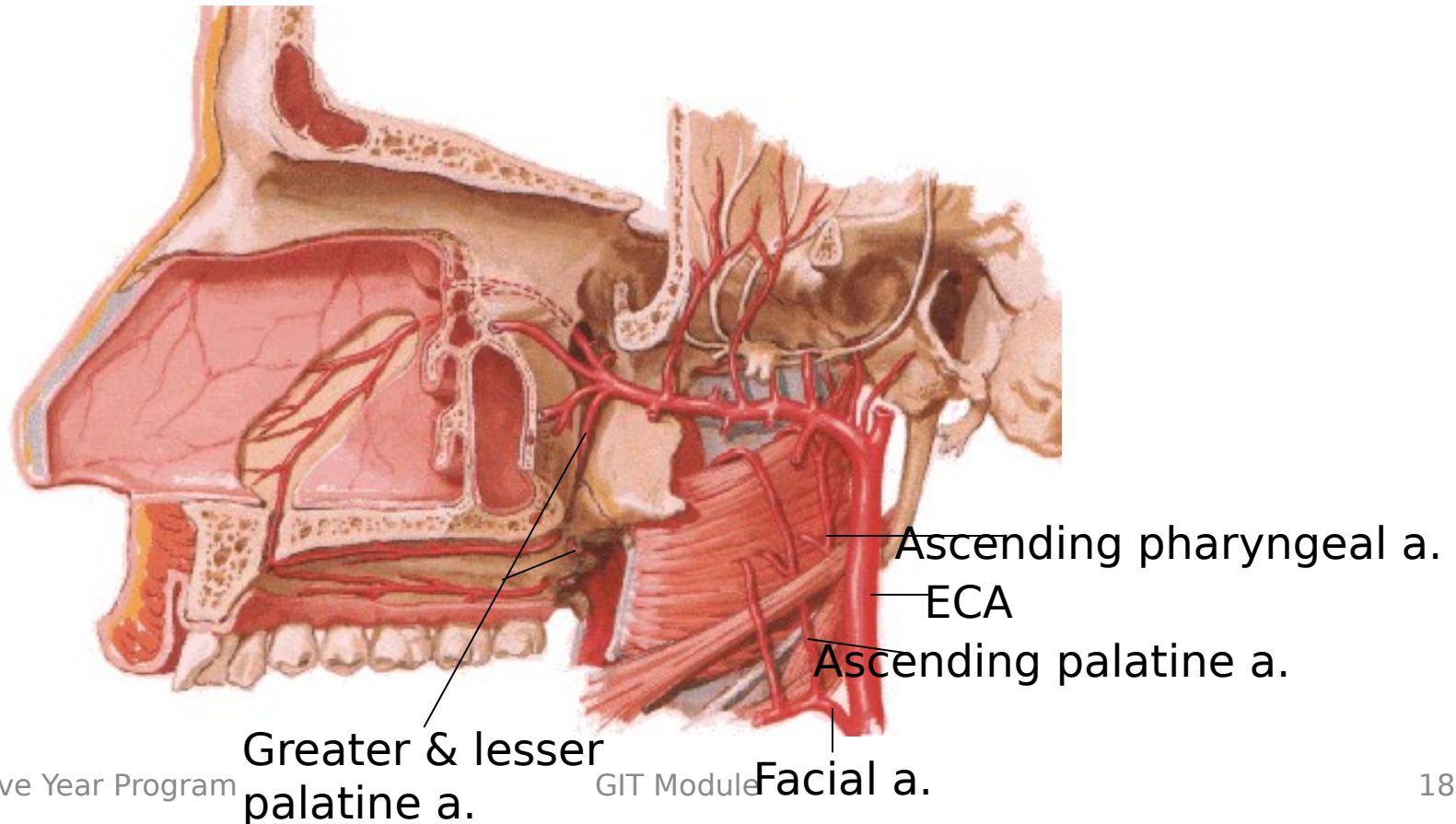


# The Soft Palate

## ❑ Blood supply of the palate:

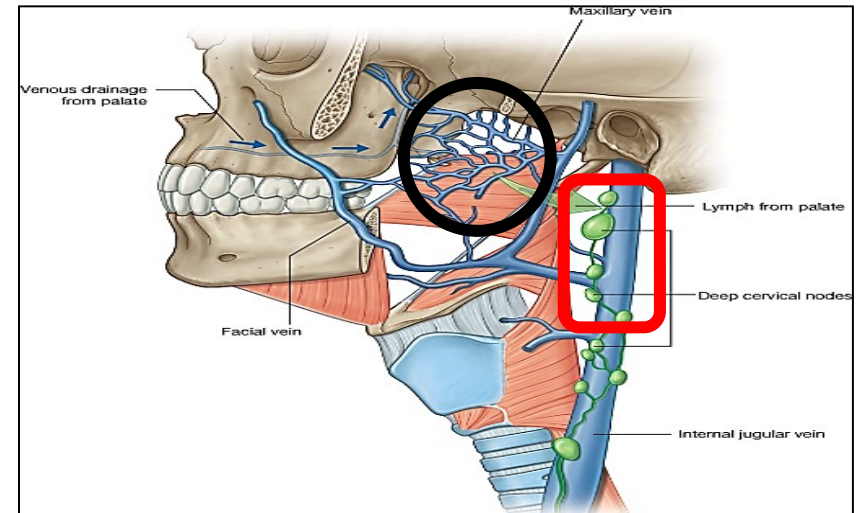
### ▪ Arterial supply:

1. Lesser palatine of maxillary artery.
2. Ascending palatine of facial artery.
3. Palatine branch of ascending pharyngeal artery.



# The Soft Palate

- The veins end in the pterygoid plexus of veins.
- **Lymph drainage:**
  - Upper deep cervical
  - Retropharyngeal L.Ns.





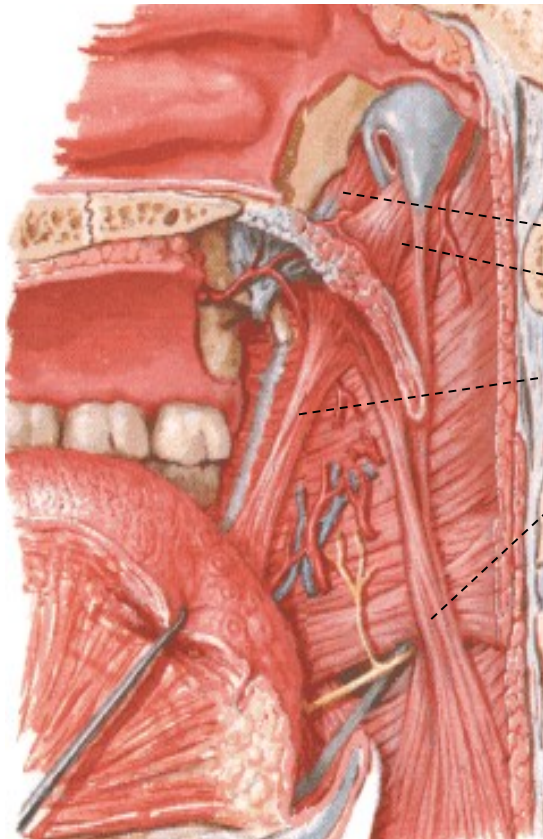
- **Enumerate the arches of fauces.**
- **Mention 3 arteries supplying the soft palate.**
- **What is the sensory nerve supply of the soft palate?**

# Muscles of the Soft Palate

**❑ Muscles of soft palate are:**

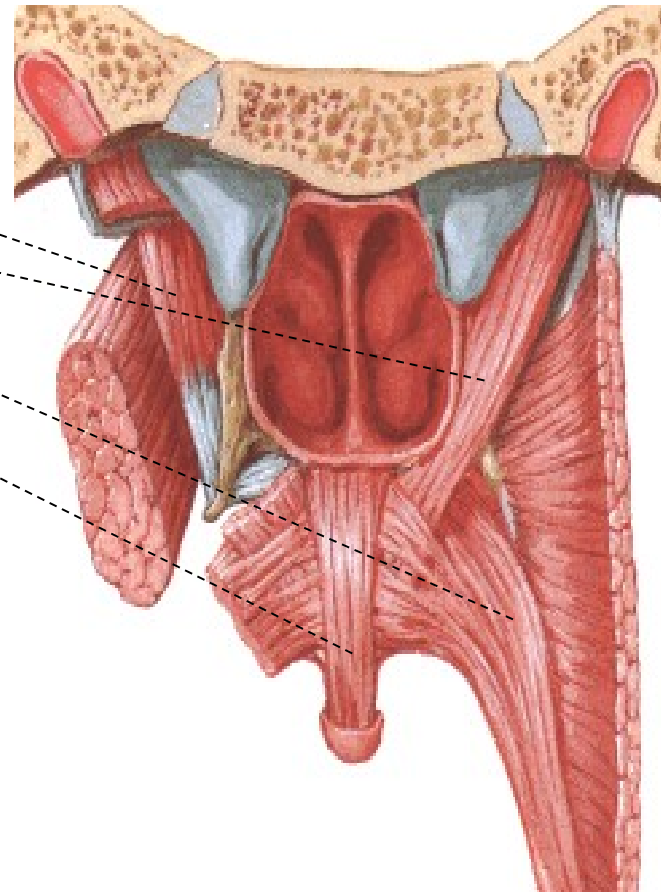
- 1. Tensor palati**
  - 2. Levator palati**
  - 3. Palatoglossus**
  - 4. Palatopharyngeus**
  - 5. Musculus uvulae**
- **All are attached to the palatine aponeurosis.**

# Muscles of the Soft Palate



## Palatine muscles:

- Tensor palati
- Levator palati
- Palatoglossus
- Palatopharyngeus
- Musculus uvulae





# Muscles of the Soft Palate

## □ Tensor palati:

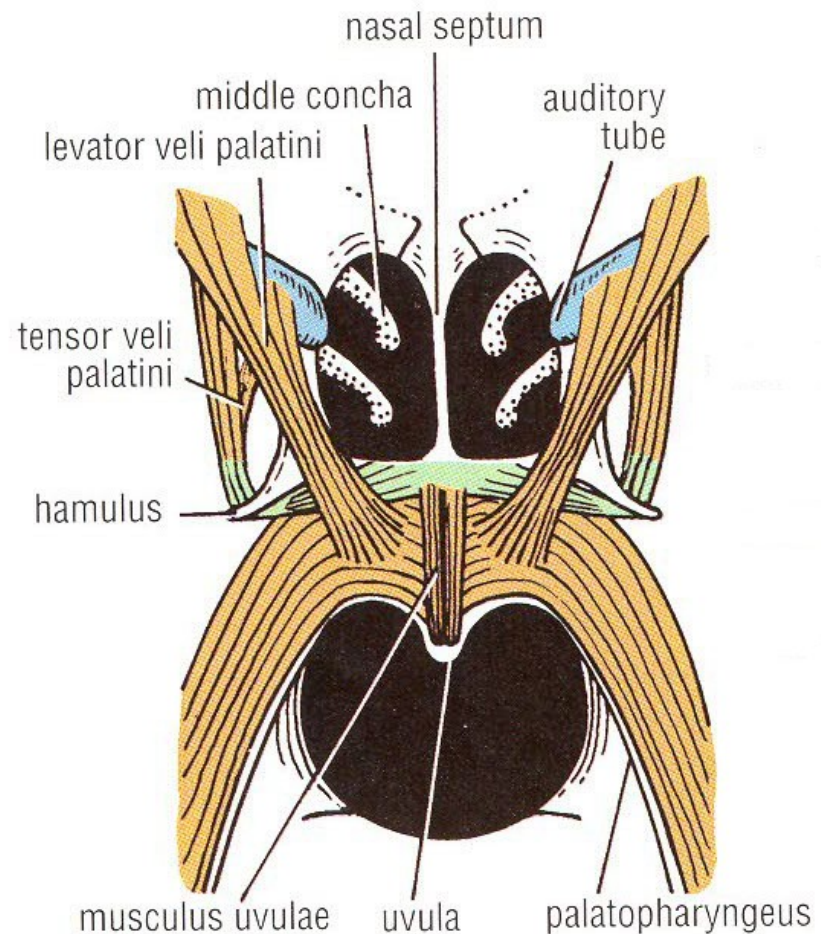
### ▪ Origin:

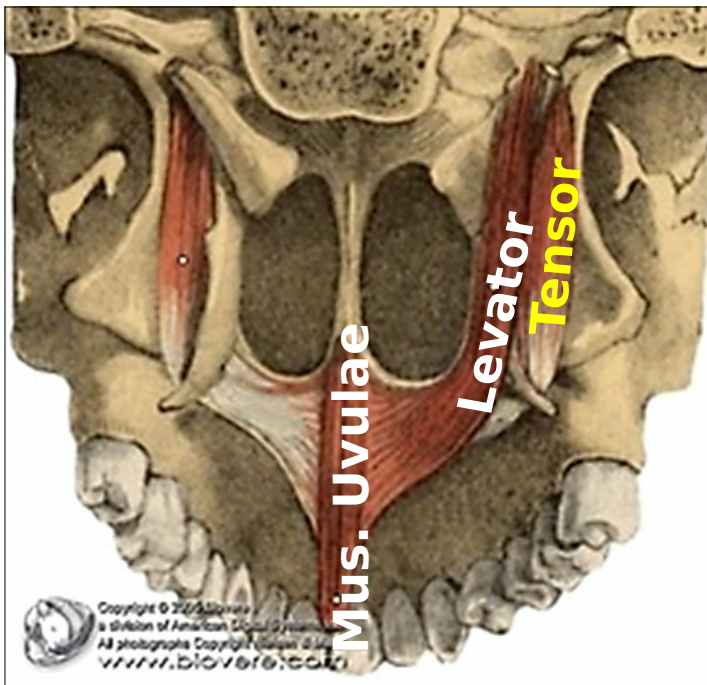
○ **Bony origin:** scaphoid fossa + spine of sphenoid bone.

○ **Tubal origin:** cartilage of auditory tube.

### ▪ Insertion:

○ Its tendon forms the **palatine aponeurosis** attached to posterior border of hard palate.





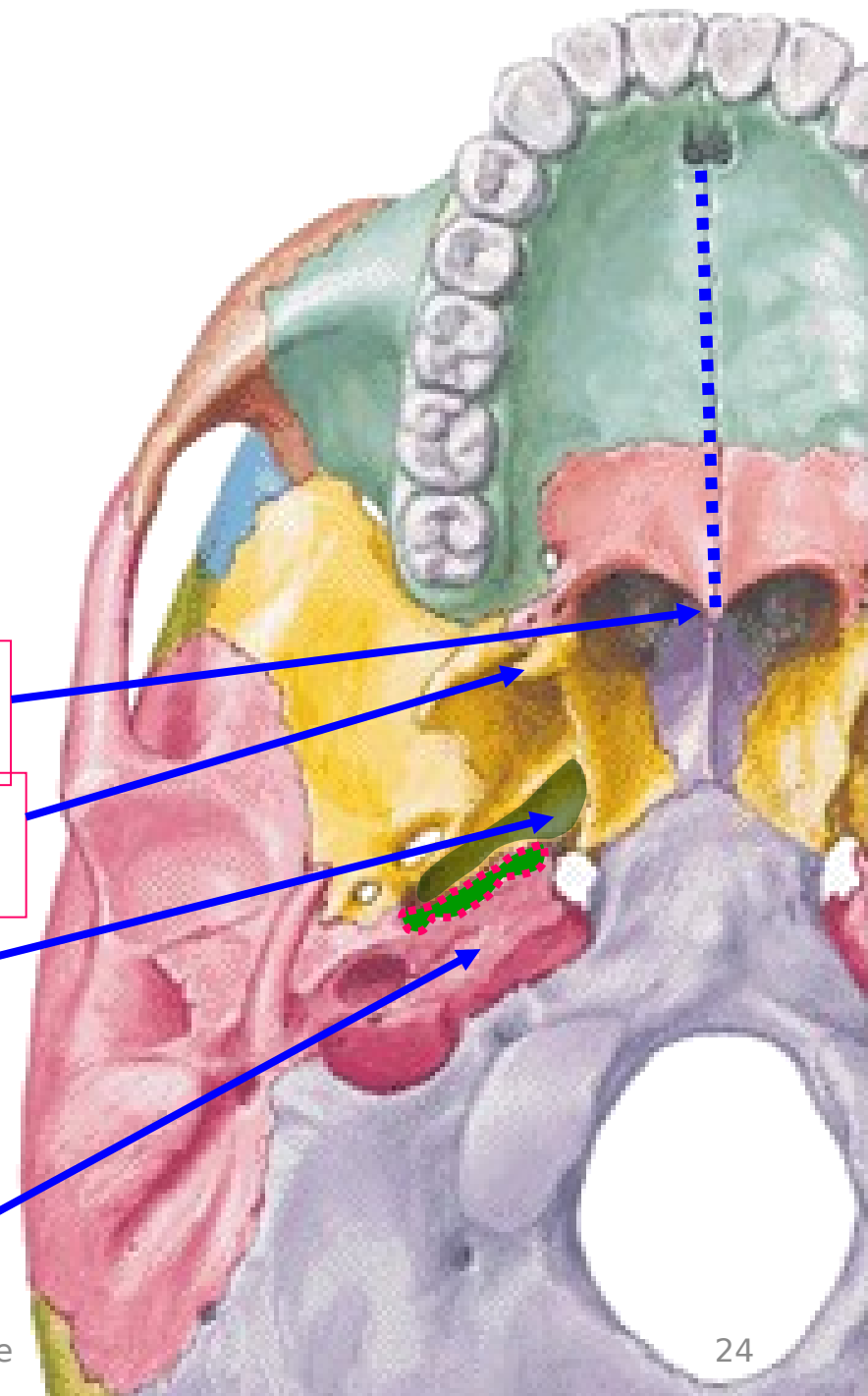
**Posterior view**

**Posterior.nasal spine**

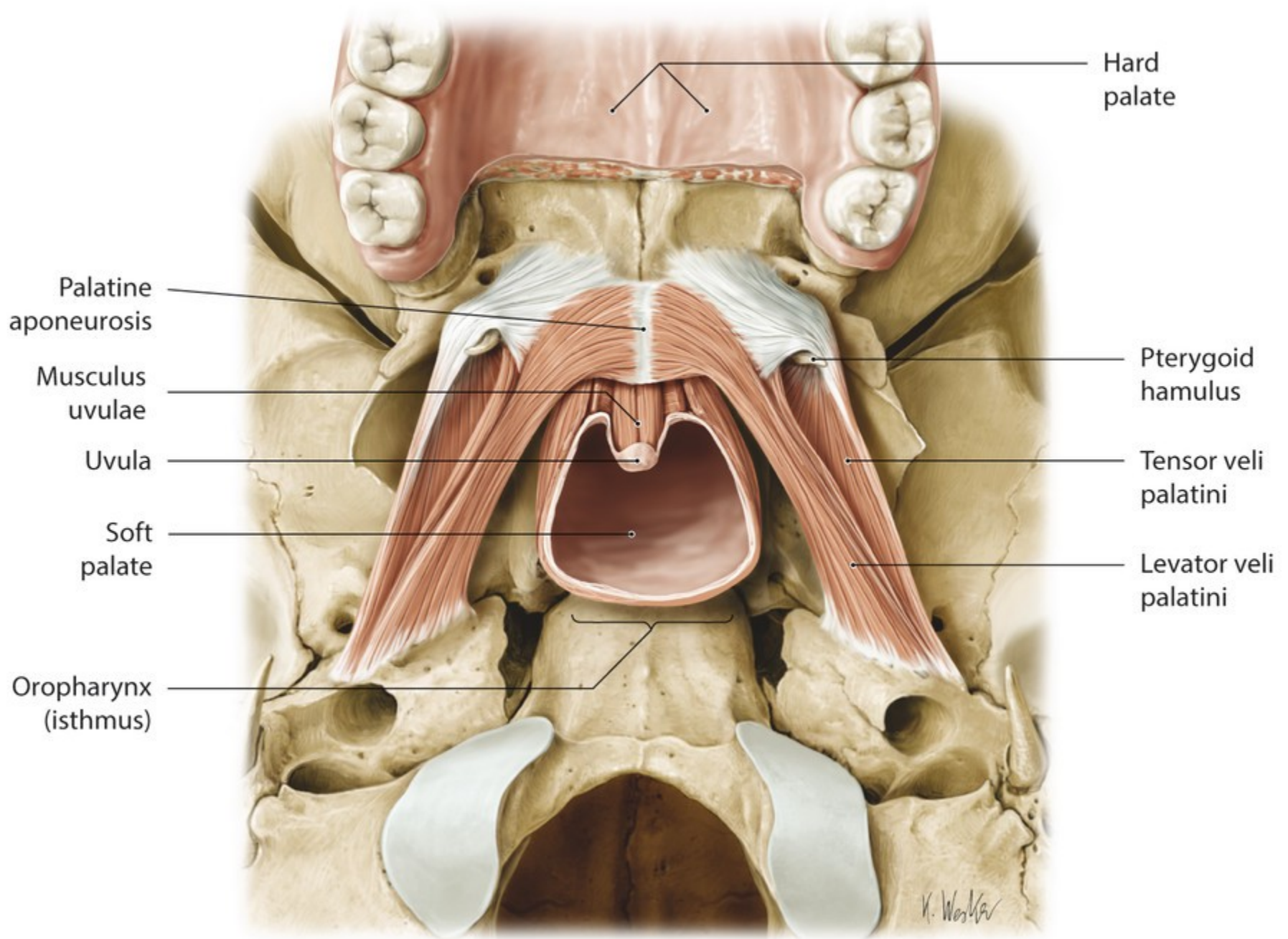
**Pterygoid hamulus**

**Scaphoid fossa**

**Inf.surface of petrous bone**







# Insertion of Tensor Palati

A

**Tensor Palati**

**Auditory tube**

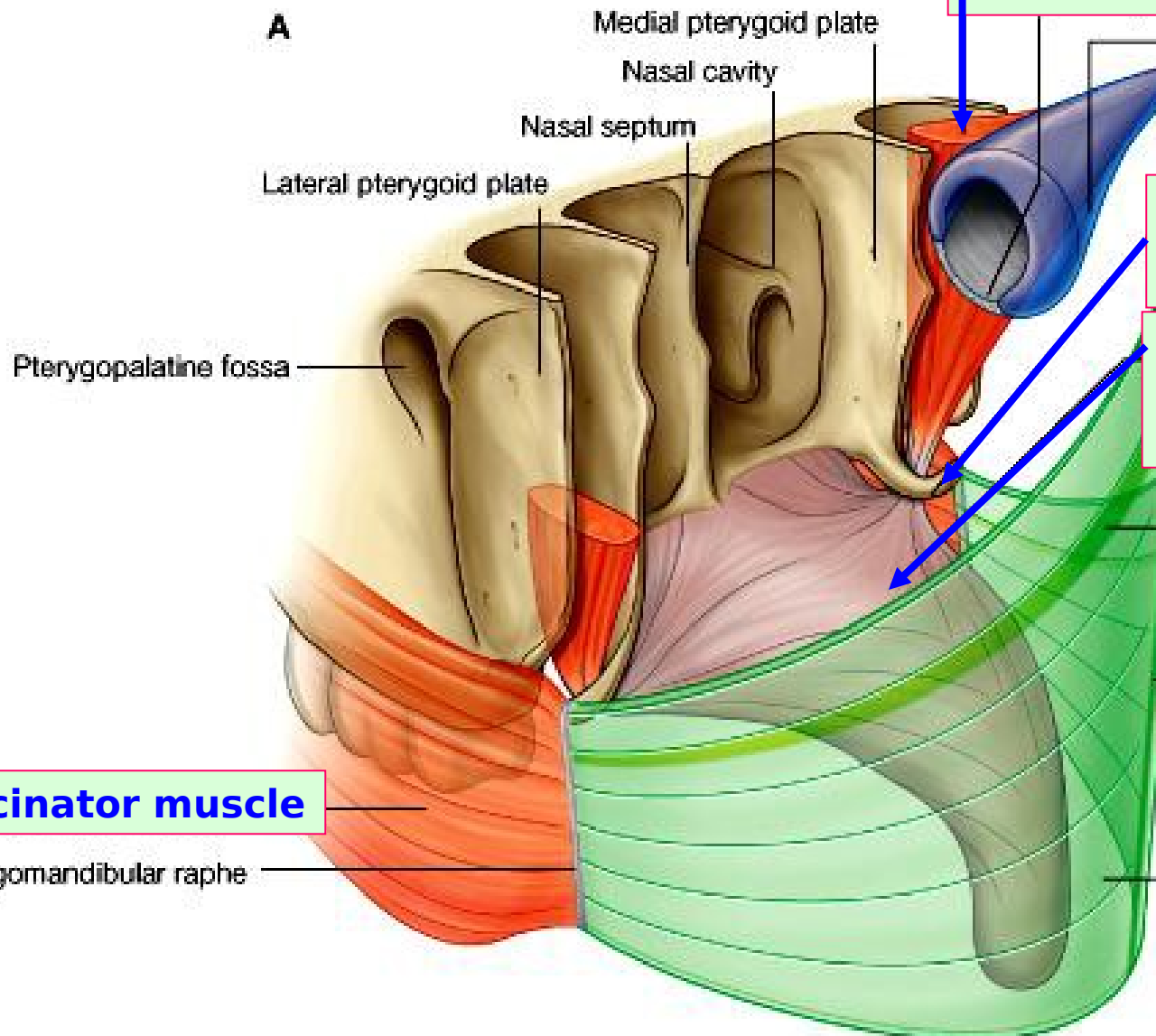
**Pterygoid hamulus**

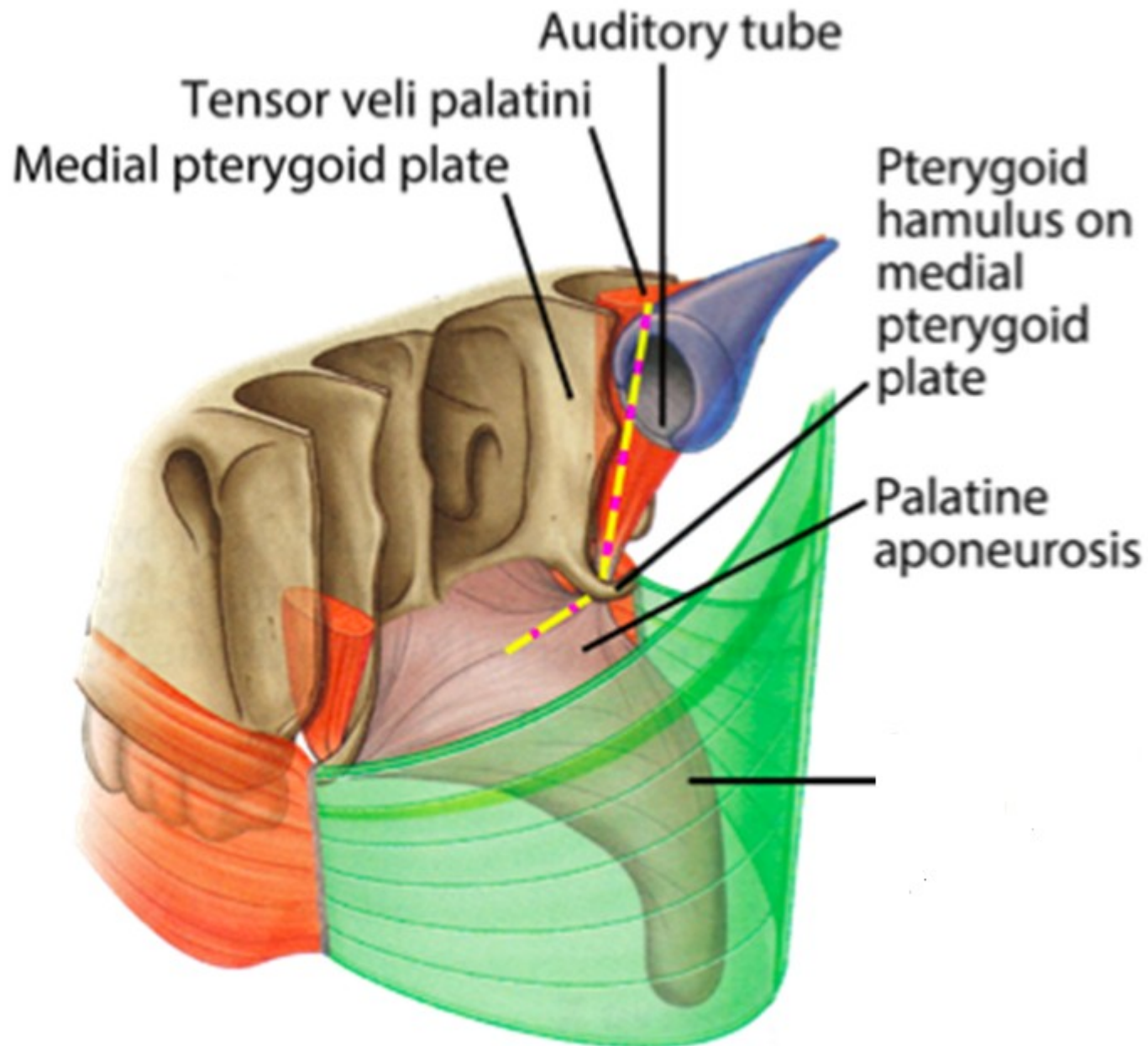
**Aponeurosis**

Position of palatopharyngeal sphincter

Pharyngeal raphe

**Superior constrictor of pharynx**



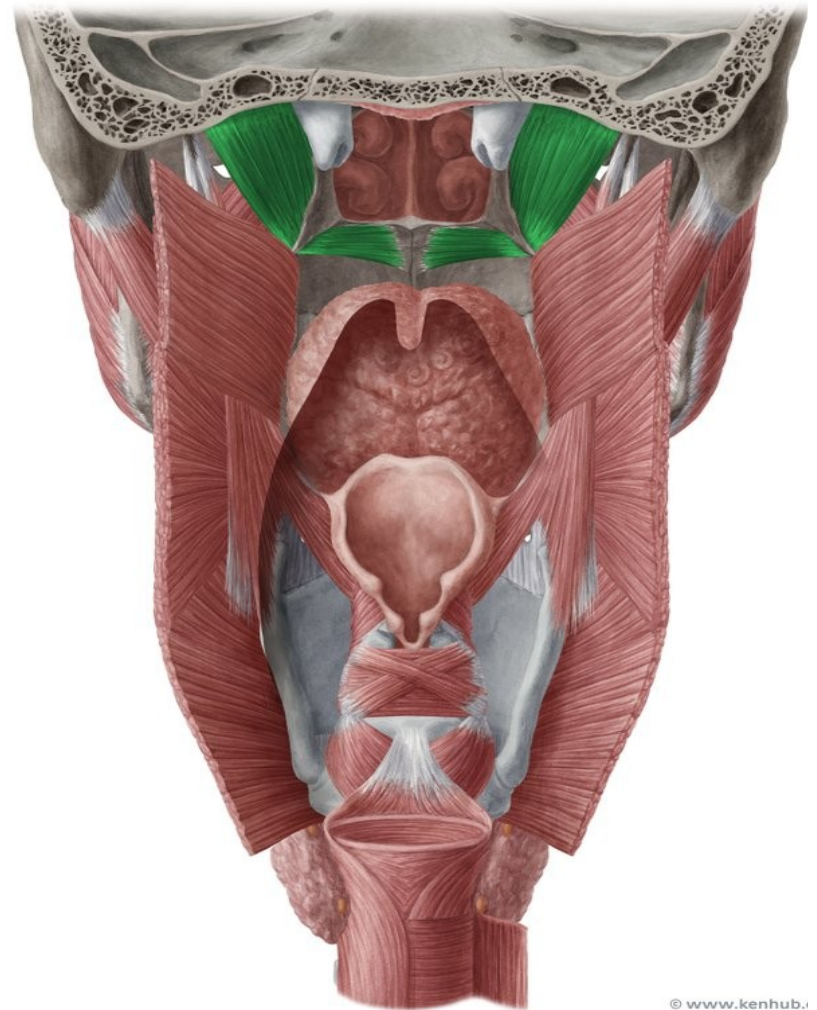


# Muscles of the Soft Palate

## ❑ Tensor palati:

### ▪ Action:

- **Tenses and tightens** the soft palate and **depresses** it during deglutition.
- **Opens auditory tube** to equalize air pressure between middle ear and nose.





# Muscles of the Soft Palate

## ❑ Levator palati:

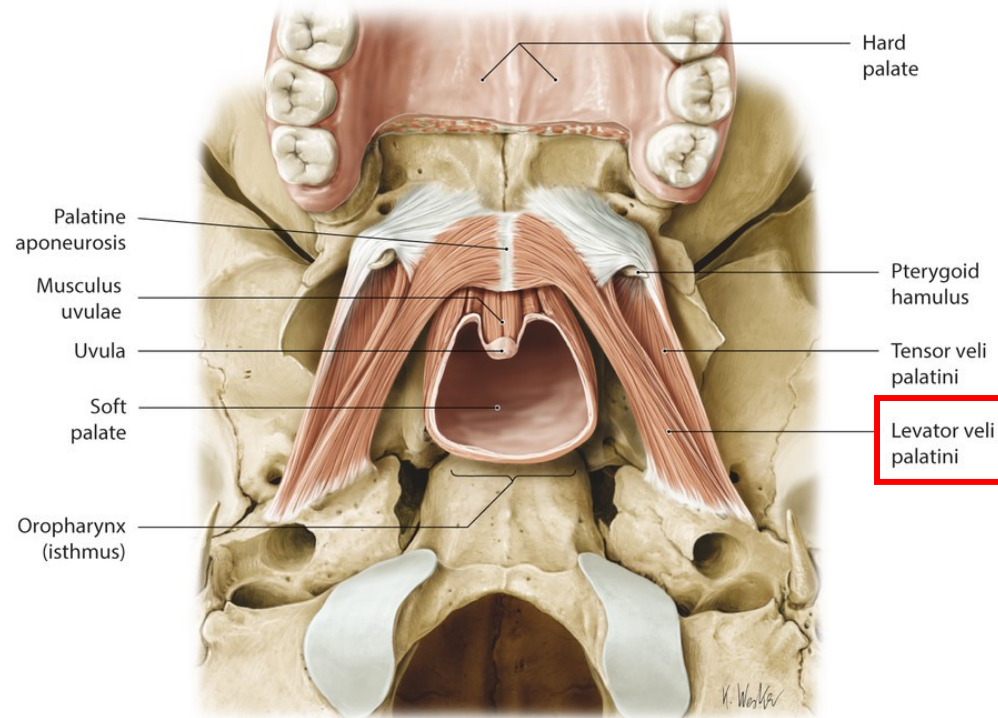
### ▪ Origin:

○ **Bony origin:** lower surface of petrous temporal bone in front of carotid canal.

○ **Tubal origin:** cartilage of auditory tube.

### ▪ Insertion:

○ **Fibers pass to the superior surface of palatine aponeurosis.**

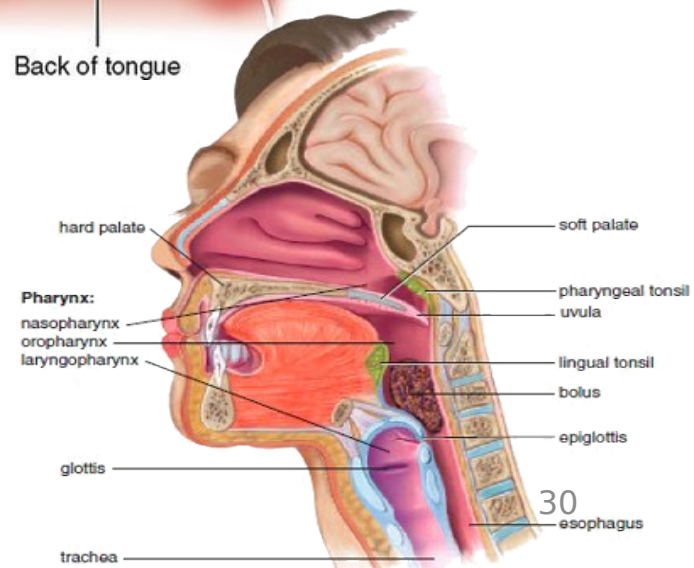
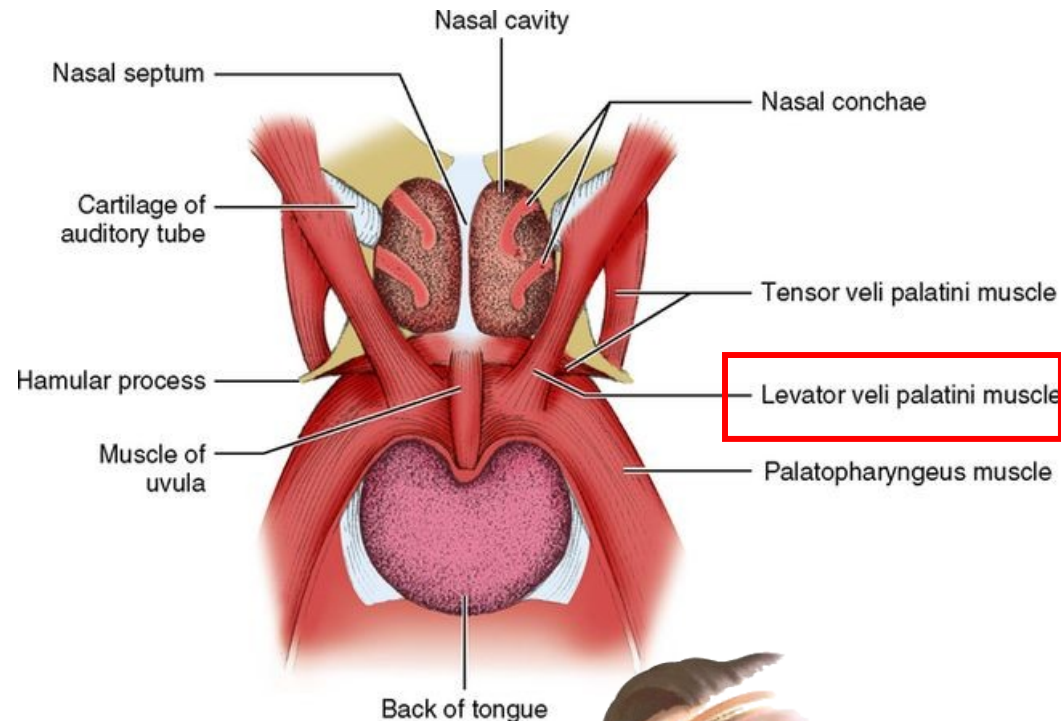


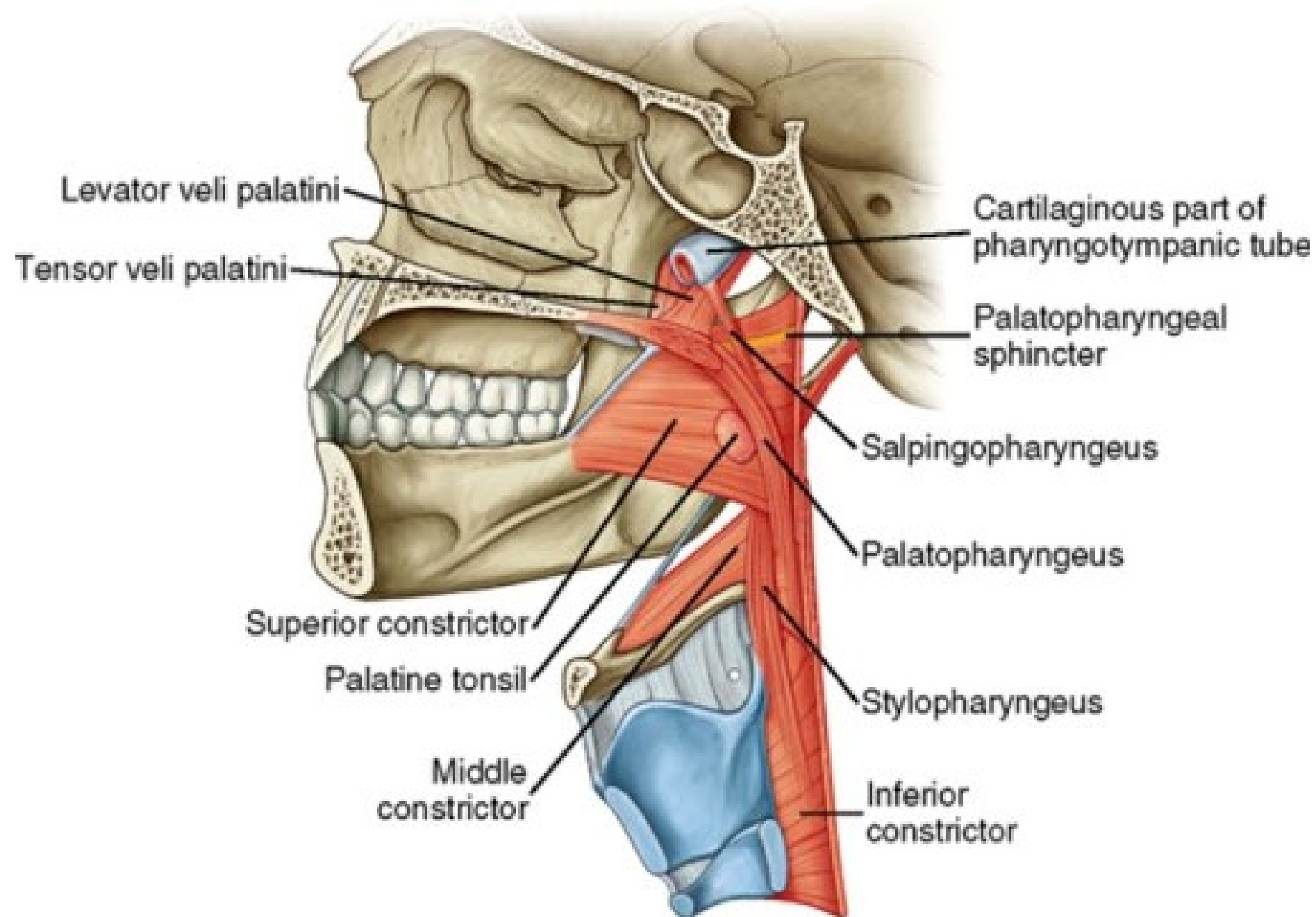
# The Palatine Muscles

## ❑ Levator palati:

### ▪ Action:

- Elevates the soft palate upward, backward in deglutition, thus shutting off nasopharynx from oropharynx so that food does not enter nose.
- Opens the auditory tube as tensor palati.





# Muscles of the Soft Palate

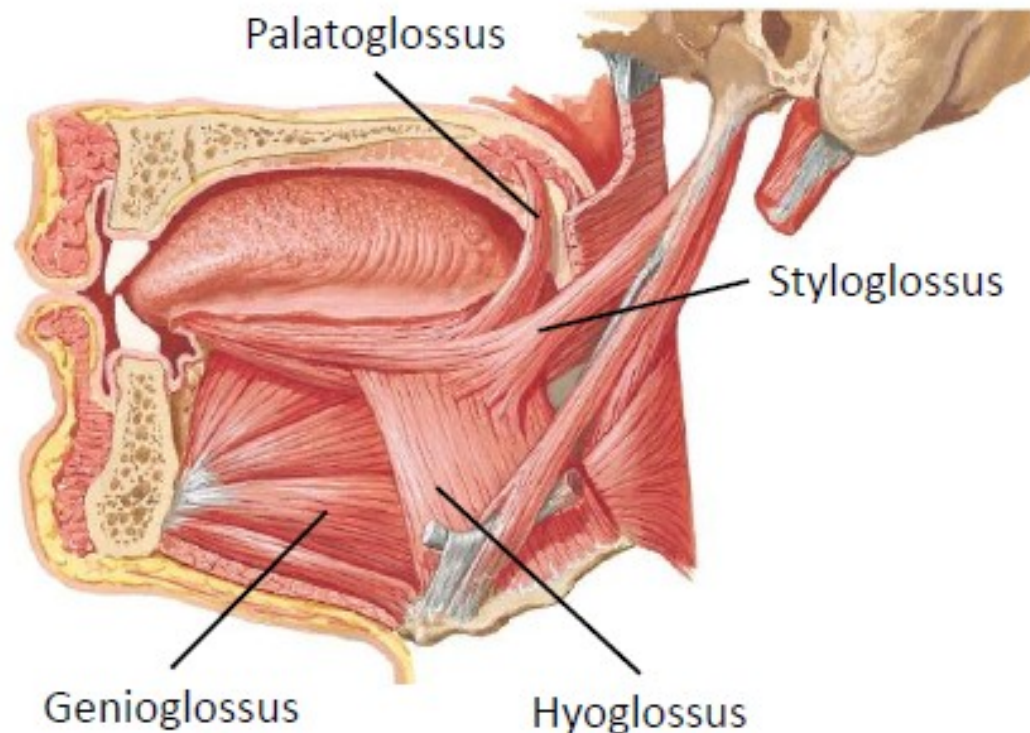
## □ Palatoglossus:

### ▪ Origin:

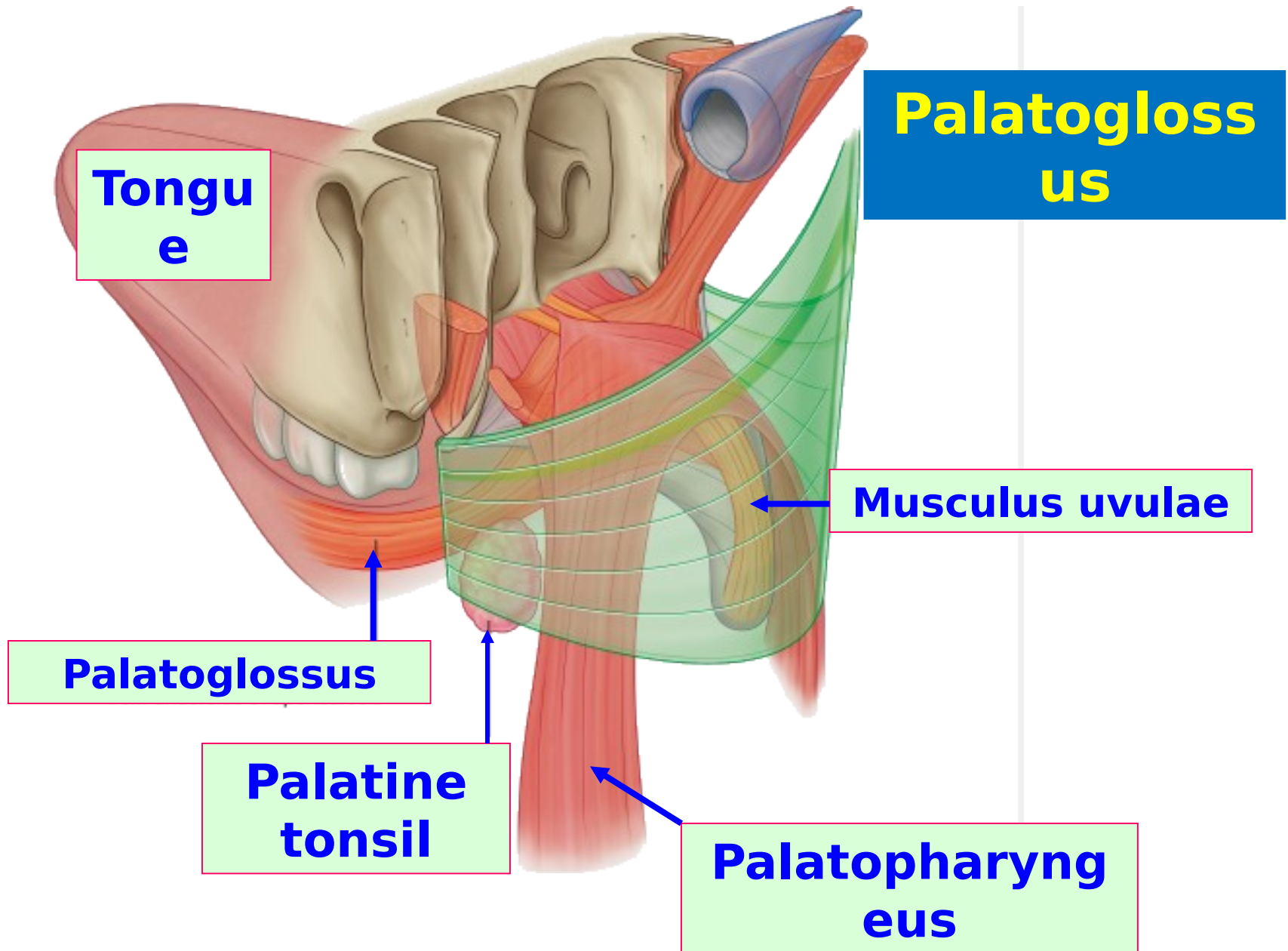
- Lower surface of palatine aponeurosis.

### ▪ Insertion:

- Descend in palatoglossal arch to side of tongue.
- Action:
- Pulls up the root of the tongue.
- Approximates palatoglossus arches to close the oropharyngeal isthmus.







# Muscles of the Soft Palate

## ❑ Palatopharyngeus:

### ▪ Origin:

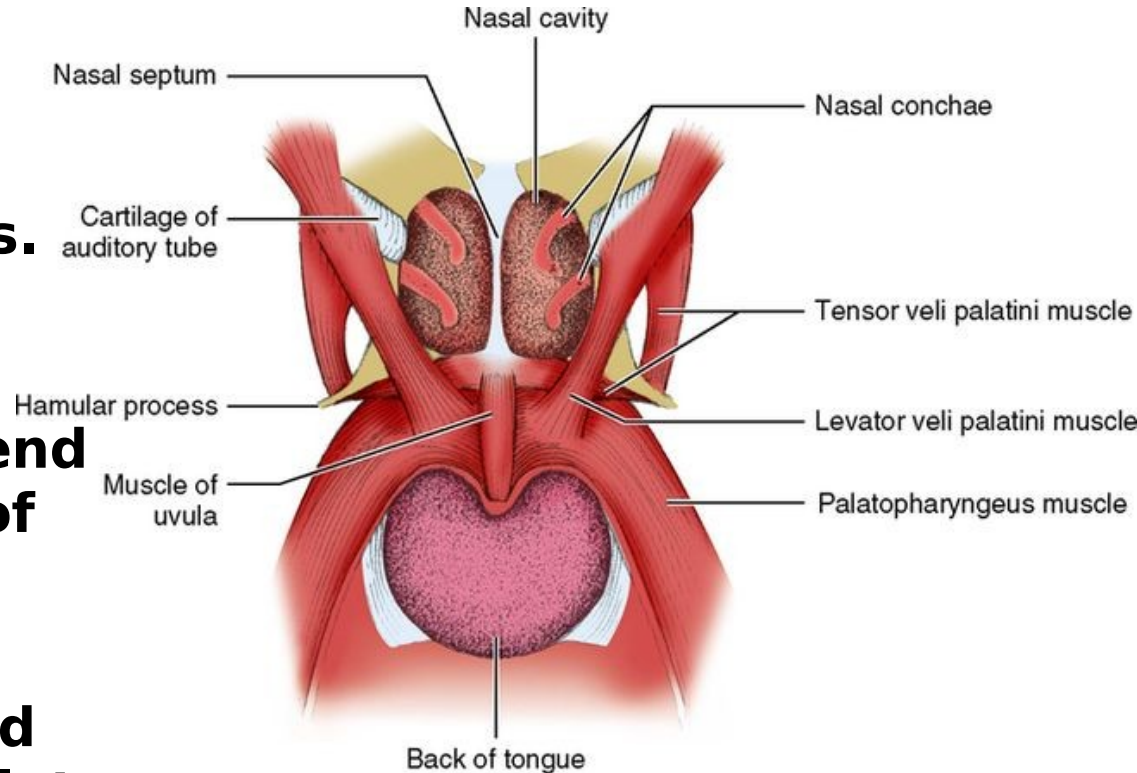
○ **Upper surface of palatine aponeurosis.**

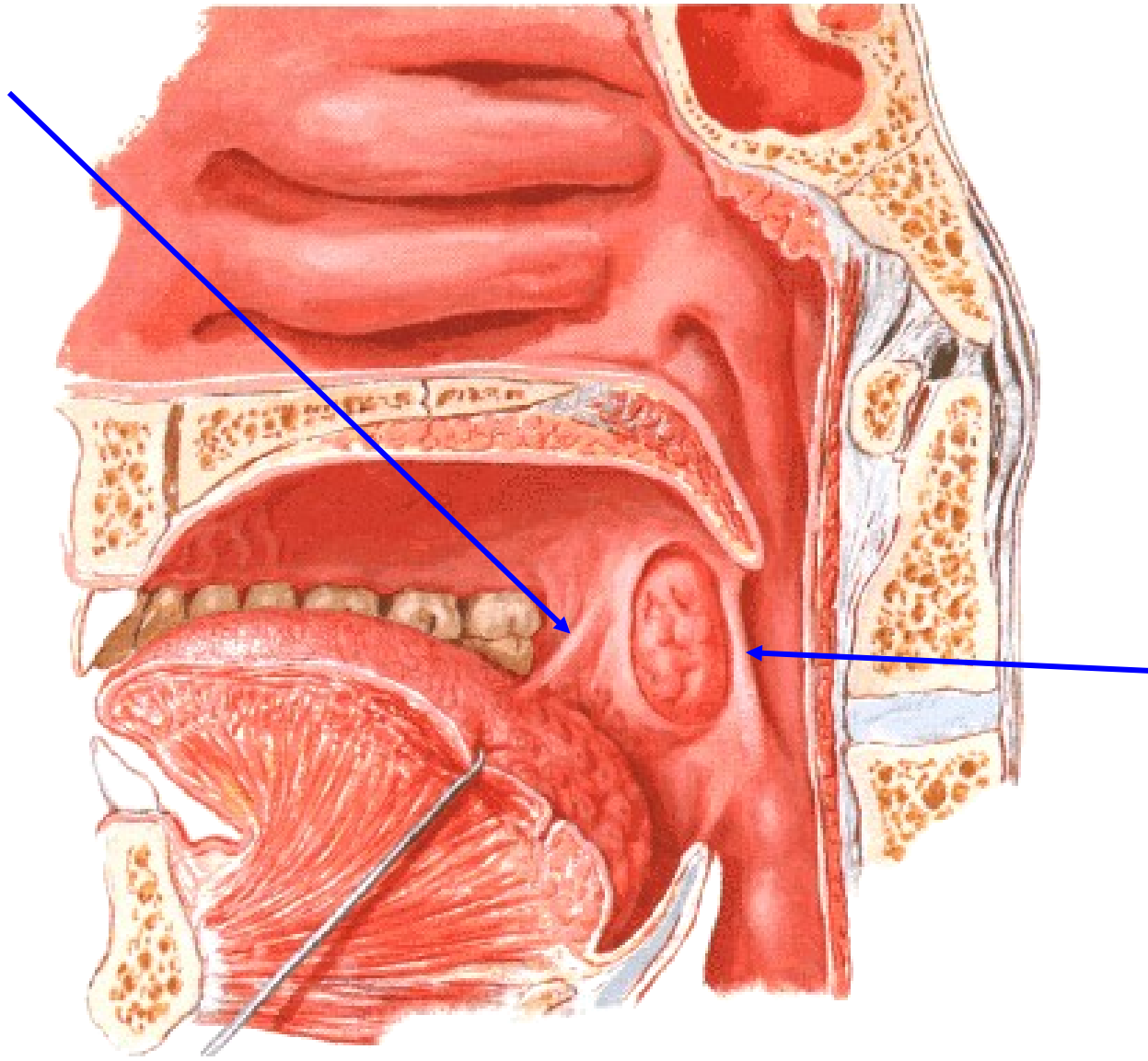
### ▪ Insertion:

○ **Descends in palatopharyngeal arch to end in posterior border of thyroid cartilage.**

### ▪ Action:

○ **Elevates pharynx and larynx to close its inlet during deglutition.**





# Muscles of the Soft Palate

## ❑ **Musculus Uvulae:**

### ▪ **Origin:**

○ **Posterior nasal spine.**

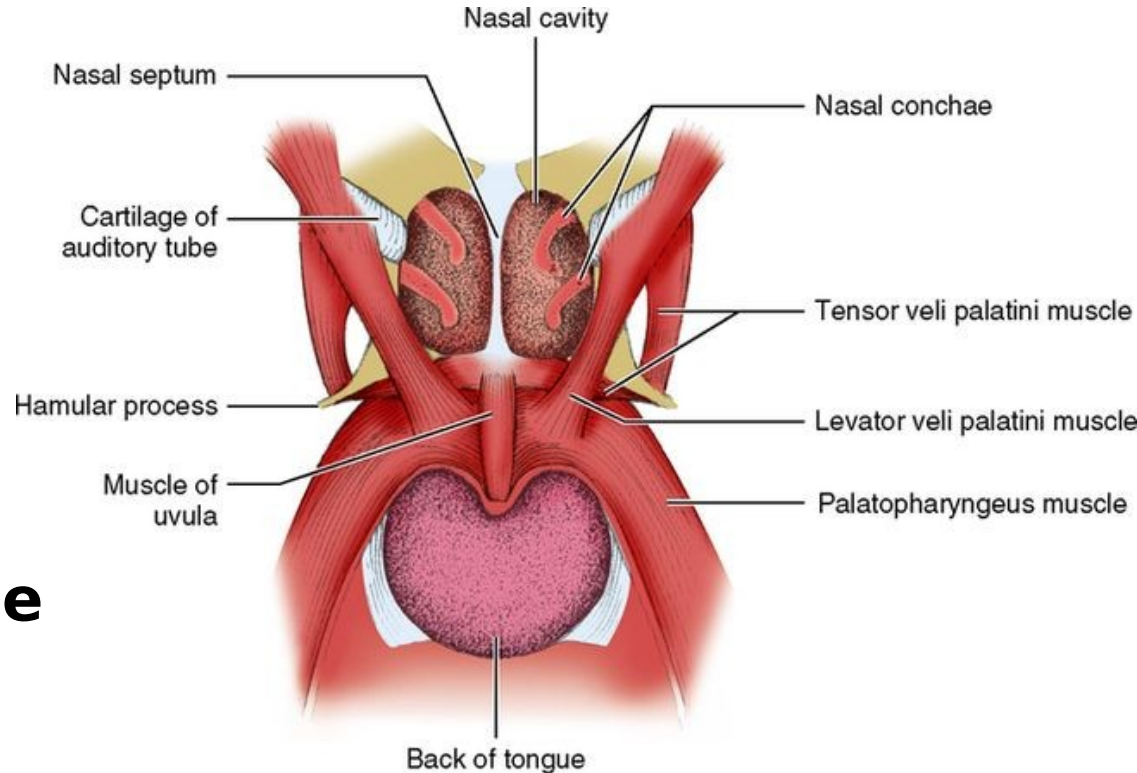
○ **Palatine aponeurosis.**

### ▪ **Insertion:**

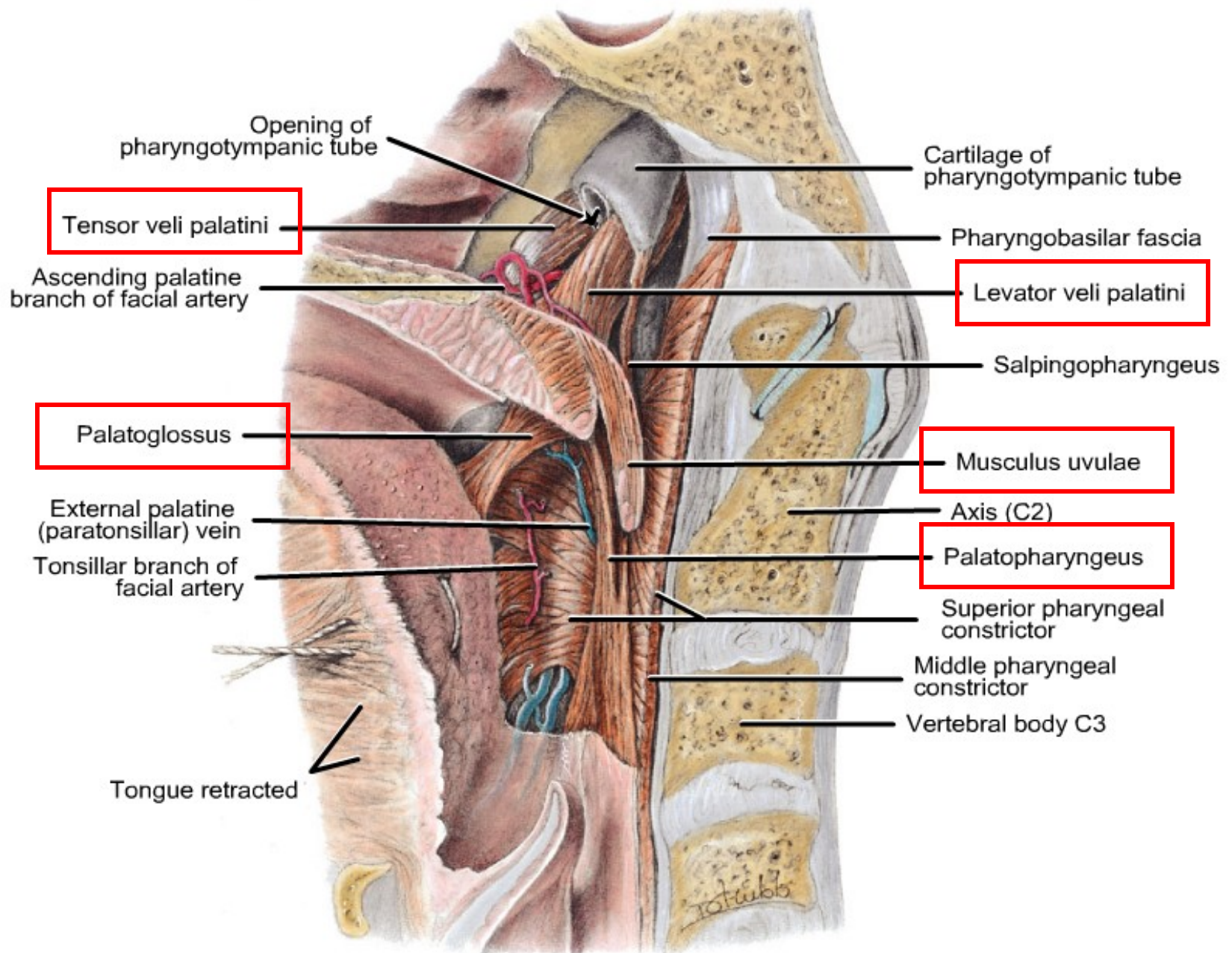
○ **Mucous membrane of uvula.**

### ▪ **Action:**

○ **Raises and retracts the uvula.**





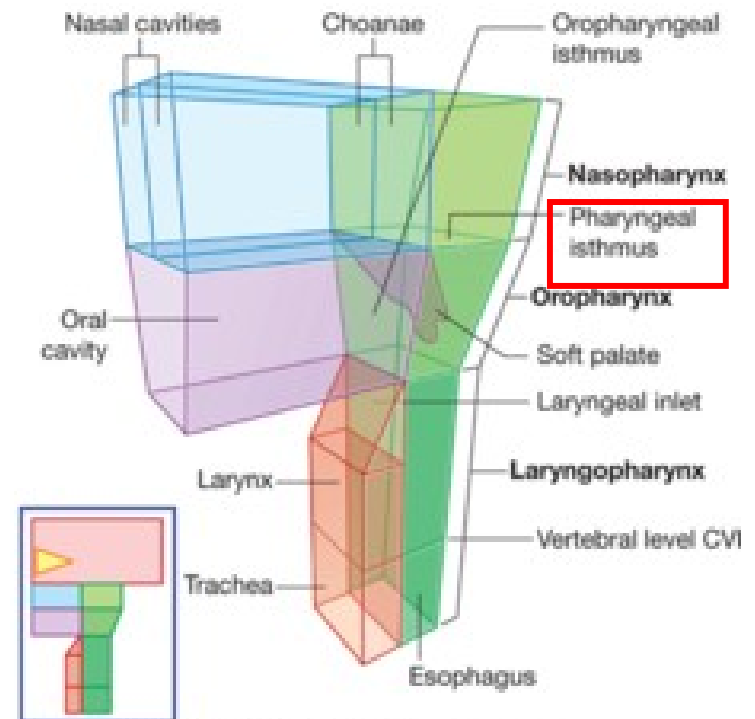
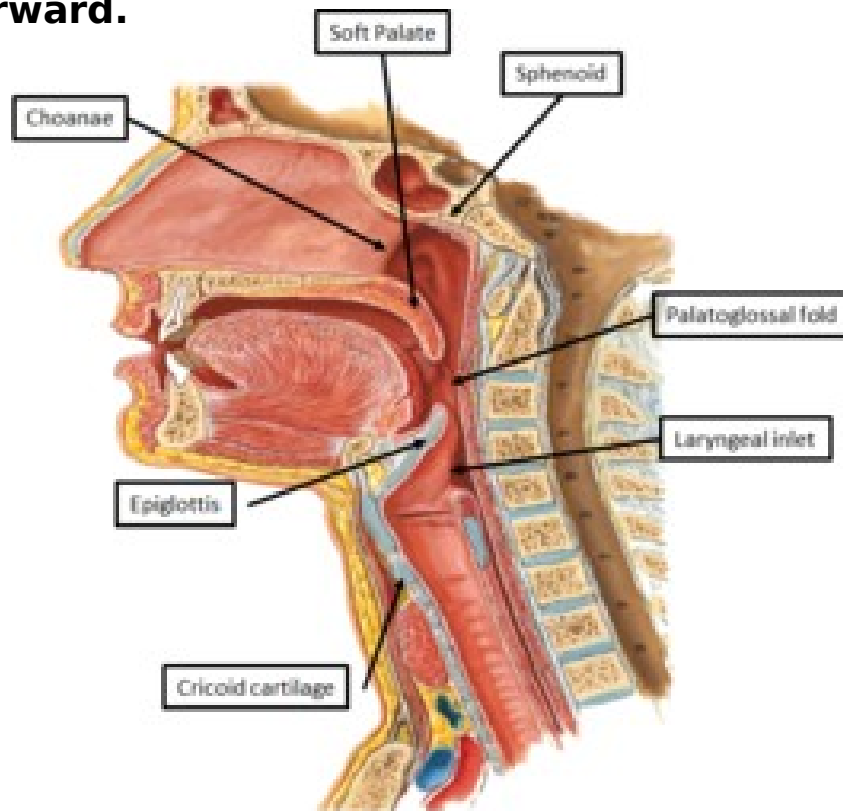


**Medial View of Right Half of Head**

# The Pharyngeal Isthmus

The pharyngeal isthmus (connection between the nasal and oral parts of the pharynx) is closed by **raising soft palate**.

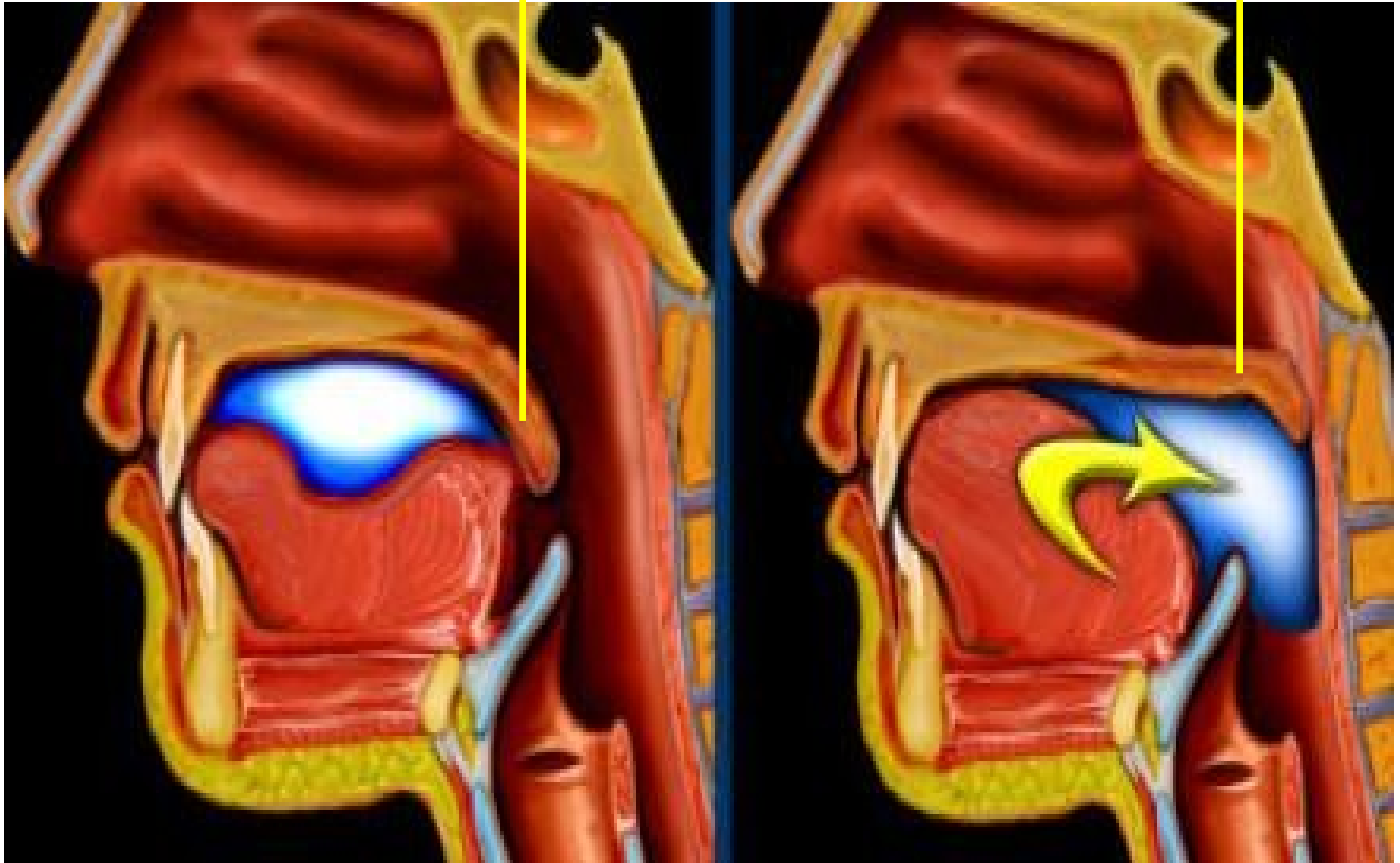
This is done by the contraction of **tensor** and **levator** palati. At the same time, the superior constrictor muscles contract and pull the posterior pharyngeal wall forward.

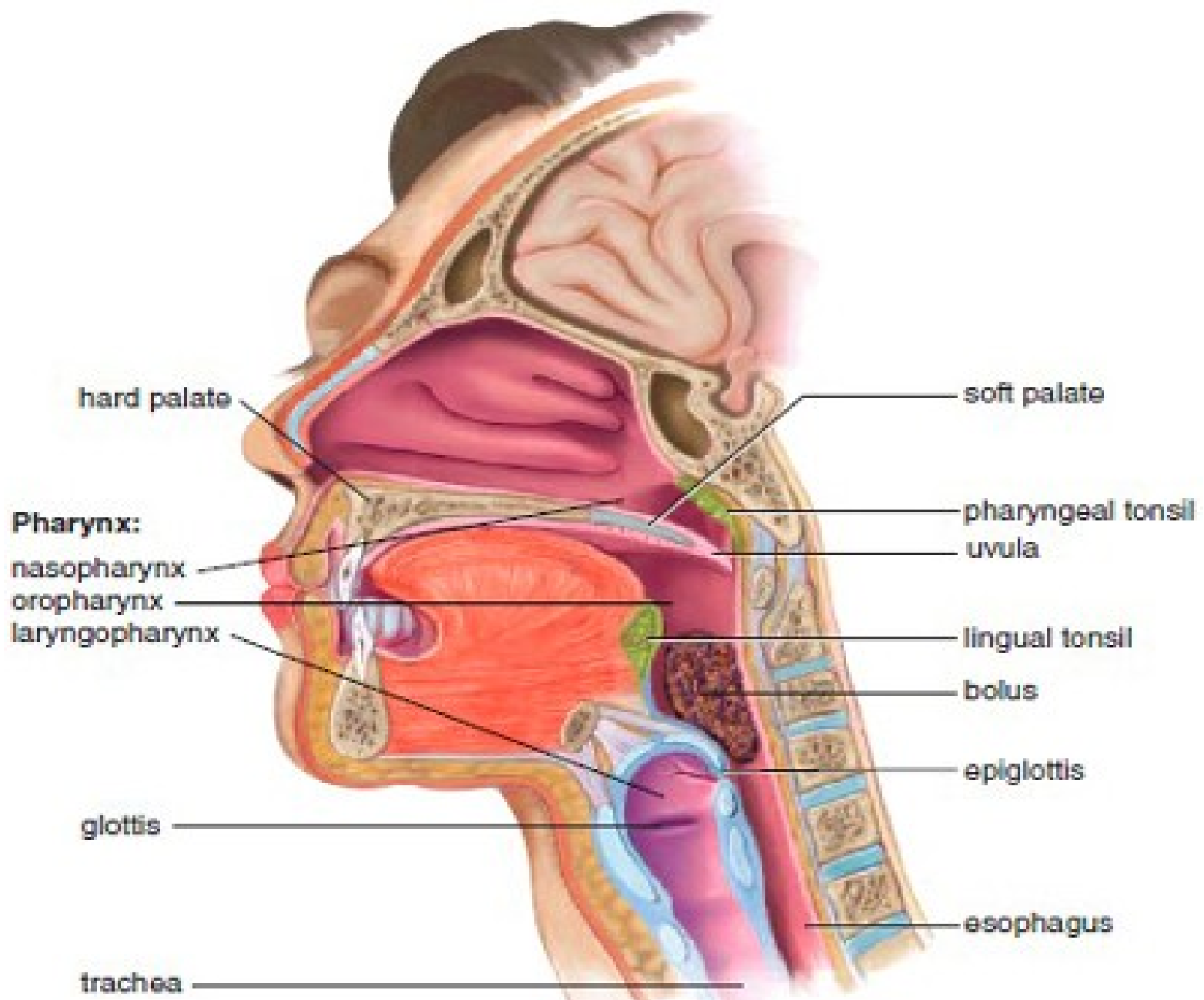


Drake's Atlas of Human Anatomy for Students, 2nd Edition  
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**Soft  
palate**

**Soft  
palate**







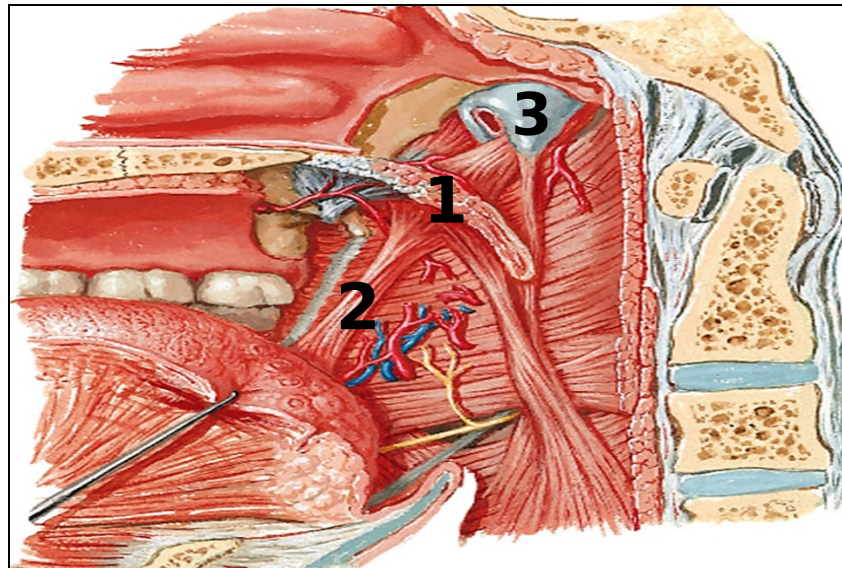
# Quiz

**Which one of the following muscles is supplied by the mandibular nerve?**

- a. Palatoglossus**
- b. Levator palati**
- c. Palatopharyngeus**
- d. Tensor palati**
- e. Musculus uvulae**

# Quiz

## Identify



Atlas of human anatomy by Frank H. Netter,  
6<sup>th</sup> Edition

# Lecture Summary



- **The palate is divided into hard palate and soft palate.**
- **Hard palate is innervated by greater palatine nerve and vascularized by greater palatine vessels.**
- **Soft palate is sensory innervated by lesser palatine and greater petrosal nerves and vascularized by lesser palatine vessels.**
- **Soft palate has 5 paired skeletal muscles; all are attached to the palatine aponeurosis.**
- **All muscles of the soft palate are innervated by cranial accessory nerve (11<sup>th</sup> CN) except tensor palati which is innervated by mandibular branch of trigeminal nerve (5<sup>th</sup> CN).**
- **Pharyngeal isthmus is closed by the contraction of tensor palati, levator palati and the superior constrictor muscles .**

# Suggested Textbooks

- 1. Gray's anatomy for students: With student consult online access, 3<sup>rd</sup> Edition.**
- 2. Snell, clinical anatomy by regions, 9<sup>th</sup> Edition.**
- 3. Atlas of human anatomy by Frank H. Netter, 6<sup>th</sup> Edition.**
- 4. Web sites:**
  - <https://studentconsult.inkling.com>**
  - <https://www.clinicalkey.com/student>**

# Thank you